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Letters from Readers

OF INDUSTRIAL FINISHING

These letters (and many others) were answered recently by the editorial department, but are published here to reveal certain interesting trends of desire and activity in the industry, and to encourage additional inquiries, comments and suggestions. Further information about any of them can be obtained by writing this office.—Editor.

Pearl Essence

Would you be good enough to advise us of the names of one or more manufacturers of pearl essence, such as is used in the formulation of spraying and dipping lacquers, etc.? —I. L. P.

Attractive Range Finish

Referring to an inquiry under the above title, in January, 1940 issue, pages 4 and 7, if you will advise us the name of the company and their location, it will be our pleasure to contact these people and offer them our "Multiform" finish which, we believe, will be of interest to them. "Multiform," as you know, produces a 2-tone color effect with only one entry into the booth.—Berry Bros.

Milk Bottle Lettering

You are probably familiar with the lacquer that is used on milk bottles and other glass containers for lettering and designing. We are wondering if you could put us in touch with the company who manufactures this type of material. This, however, is to be used on metals and would have to stand continued washing and heat, such as milk bottles might be subjected to at times.—E. E. Co.

We understand that the material used on milk bottles is a patented process called "Pyroglaze"—the patents for same being held by the American Valve & Enameling Co. of Indianapolis, Ind. This concern advises us that they have licensed a number of companies to use their "Pyroglaze" process, and that the nearest licensee to your locality is the Ceramic Color & Chemical Mfg. Co., New Brighton, Pa.

If you think this is the type of material or process you are looking for, we suggest that you communicate with the above named company. However, if you have in mind something else, write us again.—ED.

Refinished Bleach

We have some dark mahogany to refinish and our customer would like, if it is possible, to have this made much lighter. Would it be possible, after we have removed the varnish, to use some sort of bleach that would remove the stain? We will appreciate it if you can give us the name of some concern who can furnish us with material for doing this.—W. K. Co. (Designers, Manufacturers).

Yes, you can bleach this mahogany. We are submitting names of manufacturers of bleaching materials in a letter. These concerns will give you information about how to use their products.—ED.

To Clean Tarnished Brass

Do you have any textbook or magazine article on the cleaning of badly tarnished brass by means of a dipping process whereby all tarnished areas, that a buffing wheel cannot

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Further information and samples will be gladly furnished on request.

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reach, can be thoroughly cleaned? Also, have you anything on the cleaning of silverware and copper?

At present I am doing this work by means of buffing wheels, cleaning pastes and compounds, but find that it takes too much time to accomplish results. I am told that there are quicker methods by means of chemical dipping solutions. Any help that you could give will be greatly appreciated.—E. L. S.

In a letter we are submitting names of manufacturers of cleaning materials that will do the cleaning job you describe.—ED.

Luminous Paint

We have your publication dated Dec. 1939, and we are interested in the letter on page 4, regarding Luminous Paint. We would be very glad if you will kindly supply us with the names of some suppliers, as we wish to purchase a small quantity of luminous paint.—J. C. & Son (Specialists in Dials).

Fluorescent Pigments

On page 4 of January 1940 issue, you have an inquiry from a reader for fluorescent pigments. We are interested in securing the names and addresses of manufacturers of such pigments, and would appreciate your help in this matter.—O. I. (Specialists in New Jewelry Items).

We are interested in receiving information concerning fluorescent pigments and lacquers, as mentioned in your issue of October 1939.—N. T. R. (Store Fronts).

Information supplied.—ED.

Christmas Tree Paint

From what I have been able to learn, there is a special oilpaint used with an airbrush to paint natural Christmas trees white. Several readers of our paper are interested in knowing who makes this paint and, if possible, something about how it is used. I shall be grateful to you for any information you can give me on this subject.—C. M.

We are just wondering if you really mean "white" or "silver"? Practically all of the painted Christmas trees we have seen in recent years have a sort of silver color which is really a light silver-colored aluminum

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lacquer that is probably sprayed on with a spray gun—possibly with a portable outfit.

Most of the paint, varnish and lacquer manufacturers either manufacture or have for sale aluminum lacquers or paints. We are not sure whether or not a special type is needed for this purpose, but the manufacturer of the aluminum paint can give you definite instructions about this.—ED.

Graining From Copper Plates

Can you let me know where I can get information in the form of a book on graining and finishing from copper graining plates?—P. E. A.

We know of no book on this subject, but several articles about this method of graining have been published in INDUSTRIAL FINISHING. In a letter we are submitting the names and addresses of manufacturers of graining equipment; they may have some literature that will interest you. —ED.

Black Bake Enamel

We are interested in a black enamel that will be baked—one that is as durable as possible. Also, we would like information as to the method of applying, the time required for baking, and the heat it should have to make it serviceable, hard and yet not be brittle. We are also interested in securing a water-white clear that will cover the entire surface of the sign, both black and brass—one that will not turn yellow or oxidize.

We will appreciate all the information you may consider advisable. If you have samples you can send, we will be glad to give them thorough test—Y. Co. (Metal Display Signs.)

Exhaust Fan Position

I receive your INDUSTRIAL FINISHING magazine every month and find it very educational. Wonder if you could please tell me how high an exhaust fan should be in a room 14x20x20-ft.?—D. H. P. (Supt.).

In order to give you an intelligent answer to this question, we would have to ask you for considerable more specific information — for example, what the room is used for, the heating arrangements, the size and speed of your fan, etc. We believe you will save time and obtain

(Continued on page 71)

A MASTERPIECE

results from the genius of the master—but there must be proper materials to express lasting beauty. The difference between a masterpiece and just an average finish might cost you untold sums in the loss of customer confidence and satisfaction. Perhaps you are losing business that Stille-Young products will help you to get—and keep.

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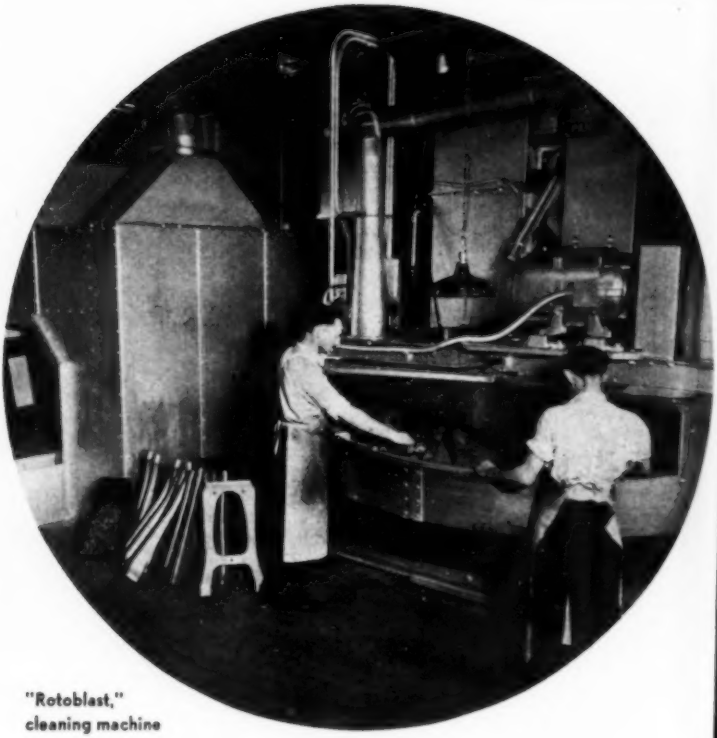
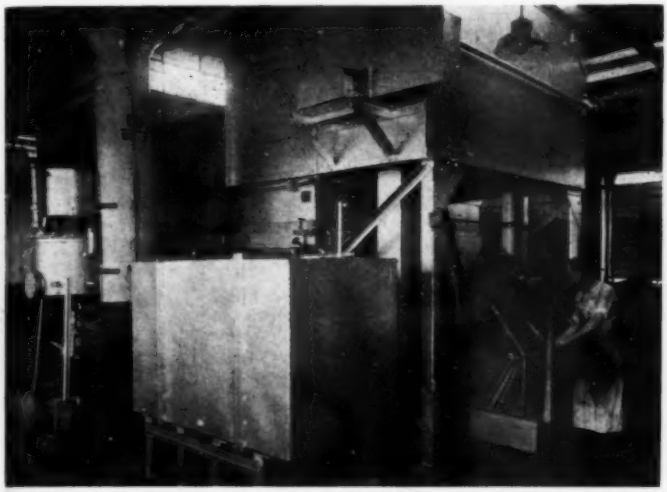


"Rotoblast,"
cleaning machine

Cleaning and Finishing Bu

Highlights of this newly-equipped metal-finishing division include two types of practical metal-cleaning apparatus — blast cleaning for the castings that have rust and burrs to be removed from their surfaces, and a semi-automatic, vapor-spray-vapor degreasing machine for chemically cleaning other parts. Also, material-handling conveyors, water-wash spray booths, tempered filtered ventilation to provide clean conditioned air, and a continuous paint-circulating system from a central paint-mixing room, automatically controlled ovens, indirect electric lighting, and many remarkable safety features for the workmen.



At the head of operations in the IBM metal-finishing department is this large degreasing unit. The operators are unloading baskets containing metal parts for electric accounting machines. Having been carried by conveyor through the vapor-spray-vapor stages of the degreasing operation, parts are now ready for spraying.

Business Machine Parts

A MECCA for industrial executives interested in observing metal finishing methods is the International Business Machines Corporation's metal finishing department at its factory in Endicott, N. Y. From the time a raw metal part receives its first cleaning, until the last gold stripe is painted over its finished surface to "dress it up," that part has gone through a completely modern process of metal finishing, involving the use of strictly up-todate equipment.

Included among recent additions to this new equipment are the latest-type water-wash spray booths and several blast cleaning machines. Besides increasing efficiency of operation in cleaning and spraying IBM's multitude of business machines, the new equipment also applies painted, Mo-

Operator in position ready to spray a batch of small parts resting on a wire mesh tray in water-wash spray booth.

roccoed, enameled and lacquered finishes of fine appearance and real durability.

These innovations in metal finishing operations are by no means solitary examples of advanced manufacturing methods in IBM's large plant. They are in keeping with a broad progressive policy of manufacture advocated by Mr. Thomas J. Watson, since becoming President of the company 25 years ago.

On the material flow chart of the metal finishing department, the new blast-cleaning machines are first in line. All cast metal parts that have rust or burrs on their surfaces receive a thorough dry-cleaning under a hail of steel, which removes all particles of rust and burrs. Following this cleaning, the spray-painting is performed under ultra-modern conditions, insuring an even flow of paint at all times, and safeguarding the health of sprayers.

Following these two initial steps on the material flow chart are the baking process with automatic time control, application of clear lacquer, striping and transfers, wrapping where required, and special finish jobs. All of these operations are likewise performed with the newest types of equipment and the most advanced methods.

Although the new blasting cleaning equipment comes under the supervision of the metal finishing department, it is located in another section of the factory where it is convenient to the shipping and receiving platform. It is composed of two large units, both of which use the rotating table principle for exchanging clean and unclean parts. The "Rotoblast Table" cleans small pieces, while the "Table Room" is used for larger parts, including 20x46-in. cast iron bases for IBM's large electric accounting machines.

Rotoblast Cleaning is Automatic on Small Parts

The unique feature of the Rotoblast is that the cleaning operation is automatic. In this machine, over 12 tons of steel grit are circulated each hour. The shower of grit gains terrific velocity as the result of centrifugal force created by a motor-driven wheel revolving 2200-r.p.m.

A large table, rotating automatically, with optional speed, carries parts in and out of the blasting chamber. One workman places small metal parts on the round table as it enters the blast-cleaning chamber, while another removes cleaned metal parts from the side where the table leaves

the cleaning compartment. After the abrasive has done its work, it falls through small holes in the table and passes down a chute. It is then lifted by an elevator and spilled across a stream of air which carries away dirt and dust particles. After this, the steel grit is used again.

Separating the blasting chamber from the exposed portion of the round table are flexible rubber strips which give operators full protection against flying particles and at the same time allow the table and parts to move freely.

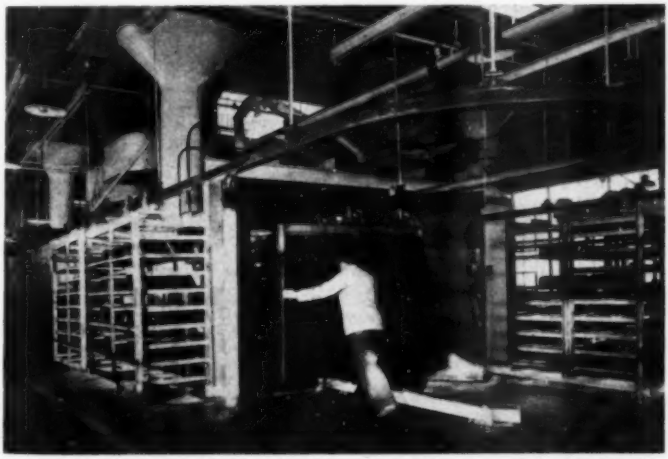
"Table Room" Cleans Large Castings

The Table Room equipment is manually operated. The table is divided in half by an upright partition that fits snugly into the wall of the blasting chamber, effectively separating the inside and outside halves of the table.

After the workman loads the table with large metal pieces, he turns the table by hand, thus exchanging clean and unclean parts inside the chamber. The cleaned parts, which come to the outside, are then removed from the outside half of the table.

An operator stands inside the machine directing the flow of abrasive through a hose. In this way he is able to clean large parts thoroughly, despite any intricate angles and small pockets. The operator within the compartment wears a coat and safety helmet that are padded against flying particles, and he receives a continuous supply of filtered fresh air through his protective helmet.

Unlike the Rotoblast, the force of the steel abrasive grits in the Table Room is attained by air pressure from a large fan instead



Newly-painted parts on racks (hanging from a monorail conveyor) being fed into the 48-ft. oven. Although the parts to be baked are fed into the oven manually, they are removed automatically at other end, after proper baking time, by means of a mechanism controlled by an IBM program control device. Baking temperatures, to 350° F.

of a wheel. The used abrasive that accumulates on the floor of the compartment is shoveled into bins, after which it is cleaned by air before re-use.

An example of the quantity of parts that can be handled by these machines is in the cleaning of castings, which travel through the steel shower at the rate of five to eight tons a day.

In both machines, the force and volume of the abrasive can be regulated to suit the requirements of the job. The blasting chamber in each of the machines is entirely enclosed so that no dust or grit particles are dispersed into the air to contaminate it.

A Small Cabinet-Type Blast-Cleaning Outfit

This is likewise true of an auxiliary blasting cleaning unit located at the head of the metal finishing department. In this machine small parts are cleaned by the force of carborundum instead of steel. The operation is done entirely by hand. Seated, the workman directs the flow of sand with a hose, inside the compartment. His hands fit into protective rubber gloves which extend into the chamber, and he watches his work through a glass window, thus receiving complete protection against the hurtling pellets. Circulation of air inside carries away dust from the cleaning operation.

The blast cleaning equipment gives the metal parts a uniformly clean surface, making possible the application of an attractive coat of paint that will last for many years of hard service.

Degreasing Machines, Too

Although the blast cleaning machines are used only for parts where accumulation of rust and burrs make it necessary, all other parts are put through a liquid degreasing operation before spraying. The degreasing unit is at the head of operations in the metal finishing department, and uses the trichloroethylene vapor-spray-vapor principle.

Being semi-automatic, the single degreasing unit can handle enough parts to keep all eleven paint booths busy. It carries as many as 16 baskets, each capable of holding 900-lbs., with 250-cu. ft. capacity—large enough to hold a partly assembled machine. It completes the cleaning process in 15 to 20 minutes, according to the amount of cleaning needed. By pushing a button, the operator moves the baskets through the various stages of the degreasing operation.

Vapor-Spray-Vapor Principle

The method of degreasing is similar to that used in the most uptodate manufacturing concerns. Conveyors carry the loaded baskets up and down in the machine. The degreaser, completely enclosed on all sides, is divided into three compartments through which the material passes in the successive stages of cleaning.

Two wells, one at the bottom of the first compartment and the other at the bottom of the third compartment, contain together 900 gallons of trichloroethylene solution. Above each well is a vapor-cleaning section, topped by cold-water coils. Steam coils in the well, carrying 12-lbs. of steam, heat the solution to 180° F., causing it to vaporize and rise.

The effectiveness of the vapor-cleaning process is attained, of course, from the degreasing ac-

tion of the cleaning solution, plus heat. After the vapor has risen above the loaded baskets, it strikes cold air from the cold-water coils, solidifies, and thus prevents the chemical from escaping. Water is used to cool the vapor at the rate of 25 gallons per hour.

In the center of the machine, between the two wells, the spraying operation takes place. Here the parts are given a thorough showering with the liquid solution, using it at the rate of 120 gallons per hour.

Conveyor System Included

The conveyor system carries the baskets first through the vapor bath, down beneath a partition separating that section from the spraying compartment, then up under the spray nozzles. After receiving the liquid bath, they are, in a similar manner, first lowered then lifted into the last vapor-cleaning compartment.

The first vapor process loosens most of the grease and dirt, and the spraying process washes the parts. The final vaporizing then removes every remnant of grease from the surface pores of the metal, after which metal is dried and made ready for painting.

Periodically—once a month or oftener, according to the volume of work that has gone through—the cleaning solution is refined and the tanks and coils are cleaned. The reclaimed chemical is then ready for further service. A large still for this purpose distils 60 gallons of the solution per hour, thus salvaging it for re-use.

Facilitating transportation of the baskets to and from the machine is a basket roller conveyor which half encircles the unit. On this conveyor the workmen roll the metal baskets loaded with clean parts alongside racks hanging from a monorail conveyor, into which the parts are transferred for their trip to the spray booths. Empty baskets are then rolled to the "mouth" of the machine, ready to be reloaded with parts to be degreased.

Water-Wash Spray Booths; Black Morocco Finish

One of the most important advances of recent years for health of the workman, and for the minimizing of fire hazard is utilized by IBM in their new water-wash spray booths. In this, as in all other operations in the IBM plant, requirements on any one article are not large enough to provide for a continuous flow of that part. In fact, in the main factory, 40 different types of machines are produced in 600 models, involving the manufacture of more than 51,000 parts.

The problem of spraying and the method of handling that problem is somewhat different from that of continuous production plants, such as automobile factories. Therefore similar parts are grouped and loaded on racks which are moved about on monorail conveyors, each group being handled separately.

The problem is simplified by standardization of the finish. About 90% of all parts receive a black Morroco finish. Besides its unusual qualities of adhesion, durability, and attractiveness, this type of enamel also has the advantages of being easy to apply, and of eliminating the necessity for a primer coat.

The main spray booth is 66-ft. long, designed in such a manner that it can be utilized as one con-

tinuous booth, or separated into eight individual spray booths by removable partitions. A continuous cascade of water containing water-wash solvent falls across the rear wall of each of these booths at the rate of 220 gallons per minute.

As the spray operator works, facing the curtain of water, air is drawn from behind him by large fans. Traveling at a velocity of 130-ft. per minute, the air is sucked through the "waterfall" at an aperture near the floor, while the water traps the excess paint spray and carries it away. In constant operation during the day, four large pumps re-circulate the water over and over again. Periodically, the excess paint accumulated in the water is removed.

Plenty of Fresh Air

Sixty-thousand cubic feet of air per minute is exhausted from the spray booths, thus insuring clean, healthful working conditions. The air in the room is replenished with fresh air drawn from outside by large fans. As it enters the department, it is completely conditioned, being heated in winter and cooled in summer. Another advanced feature, for the benefit of the workmen, is scientific indirect lighting overhead.

In addition to the 66-ft. spray booth, there is a second spray booth 24-ft. long, which is used in the application of clear lacquer after the Moroccoed finishes have been baked on. It is similar in design to the main booth and is used also for special spraying jobs that are always required.

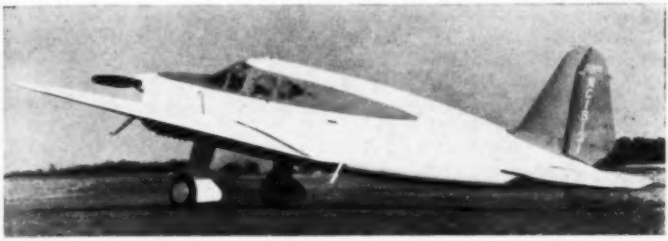
Part of the new system is a central paint-mixing room which contains a group of three tanks, one for Morocco, one for Kem enamel, and one for clear lacquer. The 300 gallons of paint in each tank are kept in constant agitation, and are pumped through pipes direct to the various spray guns in the booths. The paint continues to circulate through the feeder pipes 24 hours daily to prevent clogging.

Automatic Oven Operation

Baking is the next process. Here IBM has installed a unique feature in the form of a device which is manufactured in their own factory. It is an International Time Recording program control system which is ordinarily used in connection with the company's master clock systems. The device controls a mechanism that automatically opens the oven door after proper baking time, and automatically removes the racks containing the parts which have been baked. The racks are loaded and fed into the oven manually, however, by means of a monorail conveyor.

The new equipment has greatly simplified operations and has helped to improve the quality of finish on the company's products.

The oven is steam heated to temperatures as high as 350° F. It is of the double compartment type, with an overall length of 48-ft. Steam at 150-lbs. pressure is supplied to the coils located at the ceiling of the ovens, and air is recirculated from the ovens through the coils, and back to the ovens again. A small quantity of air is constantly exhausted from the ovens in order to keep the concentration of volatiles at very low level. *(Continued on page 64)*



"The Clark 46," an airplane built of molded plywood; colors, canary and crimson.

Finishing *Plywood Aircraft*

BY ROY B. ANDERSON
Wipe-On Corp., New York, N. Y.

SEVERAL articles have appeared recently covering the marvelous work done by American areonautical engineers, who are seeking new short cuts in airplane construction to make possible the rapid mass production of aircraft.

One phase of this new development work has to do with the surface coatings required when the airplane is made of plywood construction, sometimes referred to as the "Duramold," "Plastic" or "Laminated Plastic" airplane.

This article is designed to give those interested in the protection of this plywood material the results of tests and a satisfactory finishing schedule based on air-dried coatings.

Plywood Construction

The plywood surfaces are composed of layers of laminated wood bonded together with a phenol-resinous compound of the Bakelite type, hence the name "Plybond." In the manufacture of many airplanes, plywood is used in the construction of the fuselage, stabilizer, fin, wing and other parts. Tests indicate that this new plywood construction does not chip nor corrode; it resists water, oil and acids; offers great rigidity and is even stronger than metal.

The strength-weight ratio of plywood is more favorable than any other commercially available material, therefore its use offers many advantages for the aircraft industry. Not only are the ingredients from which plywood is made cheap and plentiful, but its use offers economical production because of a molding process which may be used. In fact, the entire fuselage of an airplane

may be molded within two hours, without the need of any filing, drilling or riveting operations. It is reported that this plywood construction will permit an increase in airplane speed of about 7% over an all-metal airplane, because its seamless, rivetless surface materially reduces the frictional drag.

Problem in Protective Coating

Before plywood could be used with entire satisfaction in airplane construction, several new and interesting problems concerning the proper protective coating had to be answered. For example:

1) The finish demanded exceptional moisture resistance to overcome any possibility of warping or cracking from expansion and contraction.

2) It demanded extreme durability to withstand exposure to the sun, rain, snow and temperature changes under all varying climatic conditions.

3) The surface had to be as smooth as glass to reduce skin friction, thereby having less drag and, as a result, permitting greater speed.

4) The finish required practically perfect adhesion and flexibility to withstand the flexing that occurs in aircraft structures during flight.

Before a completely satisfactory answer to this problem could be found, considerable testing and research work was conducted in co-operation with the Bakelite Corp., working with the pioneer in aircraft construction from plywood. These tests lasted more than three years.

First, there was the problem of formulation which was conducted in laboratories to study and formulate the proper finishes to meet all conditions. Then, many plywood surfaces were protected with these newly formulated finishes and subjected to actual exposure tests in different sections of the country, to make possible a careful study of the effect of varying climatic conditions.

Finally, a "Duramold" airplane, the "Clark 46," was finished and tested under actual flying conditions. The finish was tested by subjecting the aircraft surfaces to every possible flying strain, and to the effects of rain, sleet, snow and dirt impact. The testing on this plywood airplane covered a period of over two years, during which time the craft was in actual flight for more than 1600 hours. The accompanying photograph shows the "Clark 46," which was protected with this new finishing schedule. Its smooth, glossy finish is a canary cream with a crimson band.

Successful Finishing Schedule

The finishing schedule adopted calls for the use of three types of products, all formulated from synthetic resins and used in a 5-coat system, as follows:

1) A filler applied by rag across the grain, and then rubbed off in 10 or 15 minutes, also across the grain.

2) Two coats of a primer-surfacer, applied by spray, wet sanding between coats.

3) Two coats of finishing enamel, applied by spray with wet sanding between coats. The final coat may be polished, if desired.

The schedule requires a total time of 37 hours under air-drying conditions at about 70°F. The

use of infra red lamps, however, permits a shortening of the drying schedule to about five hours.

Specifications; Requirements

Complete specifications have been prepared to cover all the requirements of this finishing schedule, both as to the products and their physical properties. These specifications describe their moisture resistance, which is less than 4% by weight after 15 days immersion in water; their durability, which meets a 12-month sub-tropical exposure test without cracking, peeling or breakdown of film; and their flexibility, which is tested by subjecting panels periodically to a minimum deflection of 3/16-in. at the rate of 1760 times per minute for a period of 30 minutes without cracking.

Copies of these complete specifications may be obtained by writing the author in care of this publication.

The history behind the development of this interesting finishing schedule and its complete and satisfactory proof of use, indicates that airplane manufacturers, who are either using or about to use plywood in the construction of airplanes, may adopt this finishing schedule without the need of much further testing on their part.

The same finishing schedule may also be adopted with complete satisfaction for many other exterior uses of the new resin-bonded plywood. Among these new fields are manufacturers of trailers, trucks, marine work, and home building materials.

Since this plywood construction demands absolute protection from moisture from the inside as well as the outside, considerable work also was conducted on the problem of interior finishes, too. Panels finished on the outside surface with the system described here were then coated on the inside surface wth various types of sealers and coatings. Then they were subjected to moisture tests; the amount of moisture absorbtion was measured by noting the increase in weight.

The coating that proved to be the best for moisture resistance and weight consideration, was a synthetic type of material — a sealer that is applied by spraying and which dries very quickly. This sealer is recommended for the interior of wings, fuselages and other construction in the various fields already mentioned.

Reports Business Good in South

While returning to Chicago from a recent trip to Florida, V. J. Dolan of V. J. Dolan & Co., visited several of his salesmen in the southern furniture territory and "found conditions exceptionally good, with a very promising outlook for the immediate future."

United Lacquer Mfg. Co. Appoints W. M. Wright as Technical Director

The United Lacquer Mfg. Corp. of Linden, N. J., announces the appointment of William M. Wright as Technical Director.

W. M. Wright, the new Technical Director of United Lacquer Mfg. Corp., at Linden, N. J.

Mr. Wright has been a pioneer both here and abroad in the development of lacquer and synthetic finishing materials since their inception.

A Swedish peasant design in maple with splashes of color to enliven the atmosphere.

« Suggested Methods for De

BY T. J. PIRRUNG

IN THE application of color decorations to the surfaces of furniture and similar products, ingenuity plays an important role. Beautiful effects can be produced at a surprisingly low cost without the aid of highly skilled artisans. Of course, to accomplish this the manufacturer must rely more or less upon various mechanical apparatus. But this need not be complicated nor expensive. Familiar methods of decorating include the use of silk-screen stencils, spraying through open stencils, spraying between masked areas, striping with a brush or striping tool, hand or airbrush painting, and the use of decalcomanias.

For some effects, hand decorating is indispensable. However, it is frequently possible to revise designs without materially altering their effective beauty, so that a skilled artisian is not required. But to do this it is necessary to have some knowledge of the possibilities and limitations of various mechanical and semi-mechanical methods and equipment.

Silk-Screen Stencils

The silk-screen stencil process is satisfactory and economical for applying simple or intricate solid-color designs to flat and gently curved surfaces. Conventional designs requiring two or more colors can be applied by the use of additional silk-screen stencils, us-

A western blond oak dinette with lacquered trims, leather seats and relief carving.

for Decorating Furniture »

Photographs, courtesy of American Furniture Mart

ing a stencil for each color and allowing time between applications for the paint to dry. If handled carefully and used expertly, a well made silk-screen stencil will duplicate a design 10,000 times before wearing through—and in this kind of stenciling, there is no waste of material. Manufacturers who are not familiar with the silk-screen stencil process can obtain complete information by writing concerns whose names will be furnished by this publication.

Unfortunately, blended effects can not be produced with a silk-screen stencil and it is here that the ordinary open stencil, cut from heavy paper or sheet metal, has a definite field of usefulness.

Spraying Through Ordinary Open Stencils

Where only a few reproductions are desired, the open stencils may be cut from stencil cardboard. If permanent stencils are desired, it is advisable to cut them from sheet zinc. By placing a sheet of zinc between two thin pieces of plywood and nailing the plies firmly together, the design can be drawn on the plywood and then cut completely through plywood and zinc with a scroll saw. The sawed edges can be smoothed with a file while the sheet of zinc is still fastened between the sheets of plywood—to hold it flat.

Open stencils can also be made of aluminum castings—and this may be desirable where the finest results are required and where the volume of work is large enough to warrant the cost. This will involve the making of a wood pattern (generally using a ribbed design to prevent any warping of the casting) and finally the machining of the casting to make

Decorated linen chest of California design.

it fit perfectly when set against the surface to be decorated. These cast aluminum stencils produce sharp outlines, reduce labor cost, and are easily cleaned.

Selection of Design; Use of Materials and Gun

Decorating spray guns, with a ¼-pint cup attached, and using not to exceed 30-lbs. of air pressure, are particularly suitable for applying various blended effects. It is desirable to have one gun for each color, and holders for the guns should be easily accessible to the operator.

Although many conventional designs, such as birds or flowers can be applied in this manner, nevertheless great care and judgment must be used in selecting the subject. For example, a lilly can be made to look almost natural. First, you spray the lilly bloom with the correct shade of white lacquer enamel; then you paint the stem and leaves with a suitable shade of green lacquer enamel. Use a pale yellow-green transparent (not opaque) lacquer and spray lightly over the lower half of the bloom so that it is darkest where the bloom meets the stem; then it fades away at the center of the bloom. After a few hours of practice anyone can apply all three colors in a fraction of a minute. To complete the lilly, a second stencil is needed to permit application of the pale green used to paint the center pistils (using transparent colored lacquer) and the vivid bright yellow pollen (using lacquer enamel).

The tulip is another flower that can be painted with a spray gun and open stencil; the same applies to the parrot, if a bird design is preferred. The lilly, tulip and parrot are excellent subjects because they have solid uniform colors that blend out to lighter shades or into new solid colors. A mottled or speckled effect can not be readily produced by spraying through an ordinary open stencil.

Transparent Color Lacquers

It is essential to use transparent colored lacquers for some of the applications, because only transparent lacquers can give the proper blending from light to darker shades by simply varying the body of the finish. I presume that several finishing material manufacturers can supply this material, although I happen to know of only one concern that has such a product at this time. Some types of spirit stains can

be mixed with clear lacquer to produce a satisfactory result.

Inasmuch as I have seen very few products on which transparent colored lacquers are used and since, to my knowledge, it is a comparatively new product, I believe there is limited knowledge among foremen finishers about this material. The difference between ordinary colored lacquer enamels (opaque) and transparent colored lacquers is that if the former are sprayed on glass, no objects are visible through the glass, whereas if the latter are used, objects will be visible through the transparent lacquer film. If a light coat of say green transparent lacquer were used, the color would be a pale green. If an additional coat of the same green were applied, the shade would be darker, whereas in the case of regular opaque lacquer enamels, the shade remains the same regardless of the body of the finish.

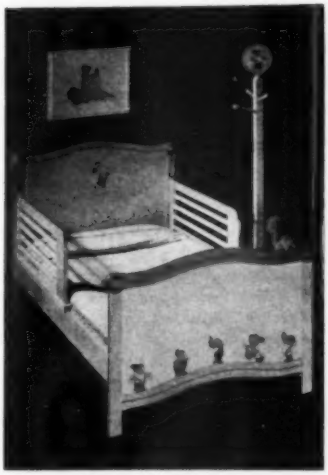
In order to become familiar with the use and possibilities of stencil decorating, the furniture manufacturer should first supply himself with the following basic colors: White, black, gold or yellow, orange, green and red—in both opaque and transparent colored lacquers. Then proceed to experiment in the mixing and application of these colors. In a short time the finisher will acquire a thorough knowledge of the fundamental requirements, and perfection in the use and application of decorative effects will quickly follow.

Decorative Striping

Little need be said about striping, as this work is generally understood. It takes a proficient and skilled operator to use a striping brush, whereas anyone can quickly become proficient with the use of a modern striping tool. When using the striping tool it is sometimes advisable to construct forms to act as guides, thereby insuring uniform and accurate results.

Decorating Turnings by Spraying in Slow Lathe

If the base color of a product is to be applied by the use of oil or water stains, or by filler, it is advisable to decorate the turnings and other parts in the "white" before assembling. The simplest method of decorating the beads or depressions on turnings, is to insert the turning in a slow-speed lathe and spray it while it revolves, using suitable shields or masks to confine the sprayed material to the desired areas. It is advisable to use lacquer for the



Snow White and the Seven Dwarfs, stenciled or in decals, add the decorative effects to this waxed birch juvenile bed.

decorating material, as the turnings can be piled back on the truck almost immediately and the stain or filler will have no effect on it.

For efficient use of this method, it is advisable to mount the lathe on a portable stand so that when the turning is in position it will be about 54-in. above the floor level. The stand should be on casters so it can be easily wheeled inside the spray booth. Turnings should revolve about 100-r.p.m. Spray gun holders should be easily accessible to the operator's right hand. A rack to hold a quantity of turnings can be suspended from the top of the spray booth within easy reach of the operator's left hand. A second rack to hold the decorated turnings can be placed on the floor within easy reach of the left hand. Steps in the decorating operation are as follows:

(1) Fill upper rack.

(2) Pick up turinng with left hand, place it in lathe, and tighten the lathe tail stock with right hand.

(3) Decorate by spraying.

(4) Release turning with right hand, remove it with left hand, and place it in the lower rack.

This operation is so speedy that a single color covering not more than 2-in. in length can be applied to 100 turnings 1½x24-in. in 25 minutes. Additional colors can be applied on the same turning while it is still in the lathe, at the rate of eight minutes per 100 pieces for each additional color. The operator does not have to move out of position except to load the upper rack and later to remove a batch of decorated turnings from the lower rack to a truck.

If the base color is enamel the decorating must be applied after the article is assembled and enameled. This may be done with a brush, in which case a skilled workman is necessary, or the decorations can be sprayed on by using shields or masks that will expose only the parts to be decorated. The ingenuity of some individual in the plant will be an important factor in determining the design of the protecting mask, since the location of the turning and the nature of the article will call for special construction features in the majority of cases.

Use of Masks and Shields

By the use of single or combination masks or shields, preferably made of sheet metal or tempered masonite, almost any part of an article can be decorated with a spray gun. Examples of this include borders and edges of table tops, chair seats, drawer fronts, overlays, moldings, etc. In some few cases masking tape will have to be used.

Of the metals particularly suitable for use as shields or masking forms, sheet zinc is probably the best material because it is so easy to cut and form. In order to make these forms hold their proper shape, it is often necessary to use wood braces or backing. When a masking form has been used 20 or 30 times, it accumulates a heavy coat of decorating material which must be cleaned off, therefore some provision must be made to permit this.

If possible, it is advisable to predetermine the decorating process before a new model or design is definitely adopted. If this is done it is frequently possible to make minor changes in the de-

sign—changes that will not affect the beauty or quality of the product, but which will be helpful in production.

This article merely touches on some of the fundamentals of decorating practices, but these suggestions should be helpful to those who have had little or no experience along this line. In the final analysis it is their constant use, together with continued effort toward improvement, that eventually brings out the most artistic production decorating at a minimum of cost.

Western Furniture Styles and Finishes

The following notes are from a report on furniture exhibited at the Los Angeles Spring Market in Los Angeles, Calif.

Most noticeable in this market was the lack of definite trends and fads in both styles and colors.

The modern which was shown can best be called American modern—a modern with graceful lines, many curves, and often basically 18th Century in contour. Finishes were darker than formerly, running to warm, golden tones.

Some functional modern was shown. Particularly noteworthy was a bedroom suite of bleached oak, square and plain, except for very unusual pulls of bright brass, so arranged in pairs that to the eye one pull worked for two drawers.

A new departure in modern was a bamboo modern set consisting of chair, bed davenport, coffee table and lamp table. Made of alder, turned and finished to resemble bamboo, it was upholstered in a gay desert cloth with a bamboo spray design.

There was less "waterfall" in the market, and some lines which hithertofore had made only waterfall added 18th Century in mahogany veneers and maple. The greatest change in "waterfall" was the trend away from extremely light bleaches to the walnut finishes. Almost all of the walnut was lightened in tone and paraded under such names as "autumn glow," "natural" and "nut brown." Lines were better and, with the advent of the more natural finishes, decoration resolved on the use of unusual veneers such as Paldoa, Guinea wood and myrtle.

In provincial styles Early California lead. Much more was shown this spring and there was a greater variety in the styling. On the whole there was a trend to more colorful decoration than in the past; the covers were of brigther and bolder colors. The decoration showed much originality, ranging from conventional flower motifs, much like the ones in patch work quilts, to geometrical Navajo patterns.

There was a return to wrought iron pulls and trim, which harmonized well with the highly decorated pieces, and 2-tone effects with combinations of finishes such as crackled white and smooth leather tone. Another innovation was painted parts in the frames to match a color in the cover.

Early California, as always, was shown in wide ensembling with everything, including lamps, harmonizing. It was distinguished this spring by the many utilitarian features . . . magazine racks at-

tached to chairs, combination book shelves and desks, drop-leaf effects on the arms of chairs and davenports.

Two new provincial styles received a great deal of attention. One was an ash bedroom suite of "cottage" type, somewhat inspired by Jacobean, in a medium light finish. For decoration there was one restrained band of carving on the top drawers and the headboard of the bed.

The other was a complete maple ensemble for bedroom, dining room and living room of Dutch Colonial, a pleasing variation on Early American. The finish was a warm, golden tone; the lines were sturdy and rustic, and the drawer pulls were of wood with a hand carved quality. Several occasional chairs were shown in this ensemble, and each was noted for its unusual frame.

In occasional chairs, there was a definite return to maple frames and unusual colonial shapes with much of the frame showing.

Rattan continued to grow in importance and its use by Western decorators has taken it out of the outdoor and patio class. Lines were more suitable for the living room, sleeker and more modern, and complete ensembles were shown, including a fine array of rattan lamps. The first rattan studio couch made its debut this January and was enthusiastically received.

Experimenting on systems for drying of wood finishes during the past decade has made possible the perfected system of today. Representing one of the most technical and complicated pieces of equipment used in the various drying and baking processes, these newly developed wood-finish dryers will pay for themselves in approximately one year, and at the same time make possible a faster production schedule. At the end of the present decade it is predicted that forced-drying systems for wood finishes will have become a necessity for all of the progressive furniture manufacturers.

Spray Equipment Widely Used

A study of The DeVilbiss Co.'s record reveals the fact that the use of spray equipment ranges all the way from the treatment of flour in the process of baking doughnuts, to the application of the finish on the giant type locomotives.

Perhaps one of the most unusual adaptions of the equipment is that by several cereal manufacturers. They infuse the cereals with a solution of vitamins through the medium of the spray equipment.

Then there is a grain concern, employing the equipment for spraying a disinfectant into freight cars to rid them of vermin before loading.

Pinocchio and Shirley Temple dolls, favorites of the juvenile world, receive their flesh tints through a rotary-type automatic spray painter, installed in a large toy factory.

Still another use of the equipment is for marking trees by the U. S. Department of Agriculture, Forest Service in New Orleans. This system replaces the old practice of branding trees with an axe.

In Jersey City, a toilet-preparation concern uses the equipment for spraying perfume on soap.

Another use somewhat out of the ordinary, is found in the plant of a sporting goods manufacturer, who employs the equipment for applying varied-colored stripes to the shafts of arrows for archery outfits.

There's the Rochester camera company using the equipment for coating film cans and reels; the motor products company which employs it for painting instrument panels and other auto fittings. Clock cases are lacquered and another manufacturer paints brake drums with it.

Uses for the spray process are varied and new ones are being discovered almost daily. Where employed, costs of operation have been reduced and production stepped up, certainly a powerful argument for its adoption wherever it can be used.

"In looking over January 1940 issue of Industrial Finishing, on pages 79 and 81, I noticed an inquiry for a book on how to mix stains and colors, from a store equipment manufacturer.

"I do not think there is a book of this kind on the market that would help this concern very much. In this article I have tried to give them some idea of how to go about solving their problem."

Ferd Rosen

Service Department

Mixing Stains to Match

FINISHES FOR CUSTOM-BUILT STORE EQUIPMENT

BY FERD ROSEN

IN ALL MY finishing experience I have never seen or heard of a book that would give you the information you desire, especially in your case where you do not use standard shade colors, but have to make special colors for almost every job you finish.

I suggest that you get about four or five primary colors soluble in each of the solvents you mentioned (water, alcohol, oil). These primary colors should be yellow, orange, red, brown and black.

For the water stains I would get these colors in powder form. For an alcohol or spirit type of stain I would recommend four or five primary colors of the non-grain-raising type in liquid form. I would also follow this same procedure with the oil-soluble type of stains.

For a water stain I would dissolve 4-oz. of each of the four or five water stain powders in one gallon of water; then use these stock solutions to make the various shades of stain by blending the different colors together until you get the shade desired. This will take a little experience and a lot of practice, but you can get a wide range of attractive colors and shades — almost any color used on any kind of furniture, such as mahogany, walnut, maple, oak or any other kind of wood.

In case the 4-oz. stock solution is not strong enough for some of the old very dark finishes, you can make the stock solution stronger, using 6 or 8-ozs. to one gallon of water; then blend them in the same manner as just described.

You can also use the same process of blending the various shades with the spirit or oil stains, except that they are already in liquid form. In concentrated primary

colors, I personally would not recommend the old-type spirit or oil stains, as the colors are not fast to light. They fade considerably and, especially on the oil stains, you will experience trouble getting the finish to hold on properly.

U. P. S. Stains

A new development in the stain industry has brought out some new and very good stains of the non-grain-raising type, which are called the U. P. S. stains, meaning uniformity, permanency, and stability. These stains come in four shades of primary colors, in liquid form, and can be blended and reduced with either alcohol or water.

These new stains are much more permanent than the old-type of spirit or oil stains, and they do not raise the grain of the wood if reduced with alcohol. This, I believe, would be the most suitable stain for your particular purpose. It is always ready to use economically; it drys in about half an hour, after which the stained surface should be filled or sealed before proceeding with the final coats.

Solvents for Stains

The solvent or reducer for spirit-soluble colors is alcohol. The oil-soluble stains are reduced with benzole, naphtha, turpentine or solvent naphtha. The solvent naphtha or turpentine will give you more penetration, and naphtha or benzole will dry faster, but will not penetrate as deeply.

You can also buy the spirit and oil-soluble types of stain in powder form, and make a stock solution of same by dissolving 4-oz. of these powders into one gallon of alcohol or bensole, naphtha or turpentine, and then blend them in liquid form to get your shade.

Stain Formulas

As for an example, I will give you a formula for an 18th Century mahogany color, in the new U. P. S. stains, which is a very popular shade. It is made up of the following formula:

Orange*	(ounces) 12
Yellow*	1
Red*	1
Black*	1
Alcohol	32

*Primary colors in liquid form.

This formula can be easily changed into a redder or darker shade by increasing the red and black colors. It can be made weaker or more yellow or orange, by leaving out the red and black colors, or by "reducing the formula" more by using a larger amount of alcohol.

A good Colonial mahogany color, prepared with these new U. P. S. stains, can be made according to the following formula.

Orange*	(ounces) 2
Red*	3
Black*	1
Alcohol	32

*Primary U. P. S. stain.

These U. P. S. stains are made by the company I represent, and are also made up in ready-to-use stains of any specified color.

Emulsion Booklet

A new booklet, "Emulsifying with the Fatty Alcohol Sulfates," has just been issued by the Fine Chemicals Division of E. I. du Pont de Nemours & Co. It contains a discussion of emulsions and the characteristics of "Duponol" alcohol sulfate emulsifying agents. Sections of the booklet are devoted to solvent emulsions, oil emulsions, wax emulsions and special emulsions and sprays. Formulas for the preparation of many practical emulsions are included.

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REDUCED FROM 5 AND 11-DAY SCHEDULES TO 2 DAYS

BY W. K. PERDUE

Foreman Finisher explains how he discovered, developed and put into use shorter finishing schedules—by finding and using quick-drying materials and by daring to venture forth and try methods that others would probably term "impossible."

MANY ARE THE woes of the finishing foreman. The poor fellow is caught between the devil and the deep blue sea—almost continuously. He is the luckless individual who puts on the final coat. The last thing done to any manufactured product is what the finisher puts on, and the first thing the buyer of the article sees is also this very same last coat. It's the dolling-up process through which any article goes that the finisher is responsible for—and *responsible* is the correct word too.

If the fabricating departments make a slip, the finisher is supposed to fix it; no matter what kind of a slip nor how bad it is, the foreman in the finishing department is supposed to know how to make the finished surface look presentable. He must have all the answers and have on hand, for immediate use, anything that may be necessary for covering up defects.

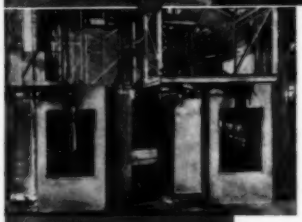
If a job comes to him two or three days late he is supposed to make up the time, so that the article can be shipped on schedule. It is this phase of the finish game that I propose to discuss in this article—based on experience.

I don't know how other finishing foremen are constituted, but it is safe to assume that they are human; it is also safe to suppose that their blood pressure increases rapidly every time the boss comes into the department with a remark like this:

"Hey Charlie, here is a job you'll have to get out by Friday. It's late coming in, but we've got to get it out on time anyway. Get busy! Do something, will you? I know you can do it. You've done it before, so I'm depending on you."

"But Mr. Boss," Charlie protests, "Those cabinets are a grained job. I can't make up lost time on work like that." *(Page 36)*

Another Complete Mahon FINISHING SYSTEM



Continuous Finishing System designed and installed by Mahon in the Allis-Chalmers Plant, Pittsburgh, Pa. Lower illustration shows Mahon Hydro-Filter Spray Booths for sparkling paint and finish coats on products carried on a conveyor line.

. . . . the Third Allis-Chalmers Plant to be Equipped by Mahon

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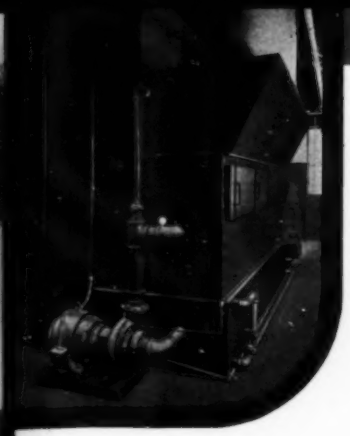

BINKS Dynaprecipitor Spray Booths wash paints, synthetic enamels, vitreous enamels and similar finishes out of the spray fumes . . . and reclaim the pigments.

In many cases this alone would justify the additional cost of a Dynaprecipitor over a regular spray booth. But even greater savings are made possible by eliminating the constant cleaning of the front surface, the fans and exhaust stacks of the booth. The elimination of fumes also reduces fire and explosion hazards, makes working conditions more healthful, and prevents complaints from neighbors.

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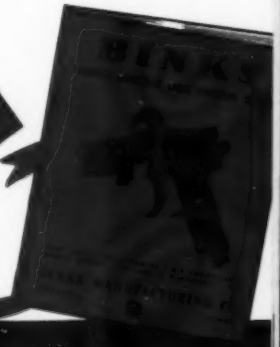

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"Grained or not, Charlie, you've got to get it out."

The boss turns away and goes on about his business, leaving Charlie standing there looking rather glum and muttering to himself. But Charlie's mutterings do not stop him from doing what the boss has demanded. The boss is hardly out of sight until other thoughts have become dominant, and Charlie's blood pressure is again back to normal.

Perhaps Charlie scratches his head in perplexity at such times. I know I do. Or maybe he is one of those rare individuals who prides himself in being able to do the seemingly impossible. Possibly he is incensed at being asked to pick up time that some other foreman has lost; but more than likely he delights in coming across with a good job, no matter what the odds are against him. It was just such occasions as these that caused me to delve into INDUSTRIAL FINISHING, to see what I could find that might help me in shortening the working time through the finishing department.

One-Coat Job Demanded

I had been asked to make a one-coat job on work that had rivets and weld spots showing—on iron that was none too smooth, some of it having roll blemishes as it came from the mill. The frame was fabricated from cold-rolled plates riveted together at the joints with buttons. Scratches and mars appeared on the faces of the plates; some of these are always present after the plates are sheared, punched, formed, etc.

"One-coat job?" I asked.

"Yes sir," came the answer. "We've got to do it to meet sales demands."

"It's impossible," I declared, "no finisher can make a presentable job by just spraying on one coat of material over steel such as I'll have to work with."

"Well, you will have to give it some thought anyway. Think up something; use your resourcefulness." And with that final shot, my boss turned to his desk to get busy on other things which, no doubt, pester even a superintendent of production.

I walked out of his office. "One-coat," I kept saying to myself. "One coat." I knew of nothing on the market that would give me a finished job over what I had to work with. I had had tough propositions put to me before, but never one like this. However, I went to work and for a week or so I gave the idea some good hard honest thinking, but nothing came of it. I didn't know of any product to use for such a job.

The finish had to be first class—a nice smooth lacquer finish, with no scratches, cracks, rivets or spot welds showing. It had to be decorated with gold striping and had to have nickel-plated hardware and trimmings. It was a storage vault door.

Solid-Color Decorated Jobs Were on a 5-day Schedule

As I said in my first article, published in Jan., 1940, issue of INDUSTRIAL FINISHING, our regular procedure was:

1st day	Clean and putty
2nd	Sand and prime
3rd	Filler coat
4th	Sand and lacquer
5th	Decorate

Five days in work, and every time I thought about it I could hear the superintendent's words: "One coat." However, this was

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DE VILBISS

not a grained job. It was our standard olive green lacquer work. Nevertheless it has a place in this article, for it leads up to the quick work we finally accomplished on the grained jobs.

For a long time we had been looking for a satisfactory primer that would dry quickly and have sufficient adhesion on metal. Primers that even approached these requirements were scarce. Oil-base primers would not dry fast enough, but they were good otherwise. Pyroxylin primers would dry rapidly, but they had poor adhesion. I had talked to several paint salesmen about a quick-drying primer, that had all the necessary qualities, and I had tried out many of their samples, but none seemed to fill the bill.

It doesn't cost anything, though, to keep driving for something you want, and that we did. Finally a paint salesman came across with a primer that worked. It dried in 20 minutes, for light sanding; had good adhesion for interior work, and could be used as a surfacer by using less thinner.

By this time the superintendent had agreed with me that perhaps a one-coat job wouldn't do. "But," he declared, "we've got to do something else then."

Two-Day Schedule Promised and Delivered

"All right," I replied, "suppose I complete a door from iron to finish coat in just two days. How would that be?" To be exact, I announced that I could finish a door, through all the operations, in six to seven working hours.

"What about the finish?" he asked.

"The finish will be okay," I replied with complete confidence.

"All right, try it Perdue. Let me see the doors when you finish them."

Here is how we did it:

1st day	clean and putty (hours)	1½
2nd	sand and prime	1
	drying time	½
	sand and fill	½
	drying time	½
	sand and lacquer	1
	drying time	1
	decorate	1

This schedule is what we are now using on this class of work. It was accomplished by using the new primer. The doors got exactly the same work that was put on them before, but the time (see schedule) was cut from five days to two. In fact, now, most of these doors are being finished in seven hours. The doors are usually turned over to us about two o'clock in the afternoon; by starting to work immediately, we get them all cleaned and puttied by quitting time, thereby obtaining the advantages of overnight drying for the putty. Then, six hours work the next day finishes the painting and decorating operations.

Work like this can be accomplished if the foreman finisher keeps abreast of the times. He can even get ahead of the times if he asks for some product and persistently sticks to the demand until he gets it. The demand for a product eventually makes it available. It was that way with our superintendent. He wanted those doors finished quickly, and, while he didn't get a one-coat job, it was a satisfactory job. When he saw the finished doors he was well pleased. So was I.

Being able to cut the time from five days to two, on standard lacquered work, opened up new possibilities on grained work. In my

Neither STERILIZATION nor DEEP DRAWING can DULL or DAMAGE this BRILLIANT BLACK FINISH

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2 **ANSWER:** YES. Use DULUX. Because it dries quickly at elevated temperatures—2 hours at 150°—DULUX gives you a 5½-7½-hour finishing schedule from sealer to packer . . . instead of the usual 29-43-hour schedule for varnish and the 22-28-hour schedule for lacquer. Also saves time because DULUX is so easy to rub.

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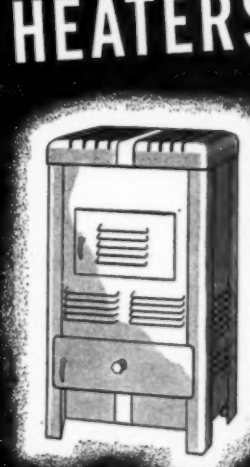

THREE seasons on the busiest conveyor line in the heating equipment industry, prove *practical superiority* of Berry Brothers newest 2-color Specialty Finish!

Ground color sprayed in *90 seconds*, pattern color in *30 seconds*. On a large house-size unit! No special guns. No extra handling. Goes as far as enamel.

Combines *"Eye Appeal,"* low finishing cost, smooth (easy to clean) surface. Heat resisting — (passed 2000-hr. heat test). This finish comes along at a time when older novelty finishes have lost most of their original appeal.

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BERRY BROTHERS

Industrial Varnishes • Enamels • Lacquers

DETROIT, MICHIGAN WALKERVILLE, ONTARIO

previous article (Jan., 1940, issue) I mentioned that the five or six days drying time for the graining color was eliminated, and it is proper now to tell how that was done.

You know, the more a foreman finisher plays around with the materials he has to work with, the more he learns. He will learn some things that perhaps he wouldn't learn in any other way. He might even become cognizant of facts that seem contrary to what is generally considered as good finishing practice. Possibly he may learn things that some of the paint technicians know, but which they do not pass out promiscuously.

Soon after the lacquer became universally used, I learned that a little linseed oil added to it would do no harm, except to retard the drying somewhat. Of course, I did not make a practice of using linseed oil in lacquer. I just found out that I could tint a colored lacquer with a little color in oil, and have no ill effects. It was this knowledge that I made use of in my graining work.

My problem was to save those drying days after the work had been grained. When the solution came, after an evening of considerable worrying, it seemed so simple that I wondered why I hadn't thought of it earlier.

The graining colors we use are ordinary colors ground in linseed oil—Van Dyke brown, burnt umber, raw umber, burnt and raw sienna, etc.—and the thought that struck me was: Why wait for the graining color to dry? Why couldn't I spray clear lacquer right over the wet graining color? There you have it! That's exactly what I told my grainer to do on the first safe grained that morning when we started to work, after I had thought it all out the evening before (see Jan., 1940 issue, page 72).

Improving Our Finishing Technique

It worked—not, of course, to absolutely complete satisfaction on that first safe, but it was passable; and we haven't changed our procedure, except to learn how to manipulate the graining color so that the color and lacquer work harmoniously together.

Our clear lacquer — the final coat—is a rubbed-effect lacquer, so that the finished grained work has the appearance of being a rubbed job. It has that soft satin "look" that is so desirable in grained work. So the finisher has to be a good "cutter outer" too, sometimes.

It worked this way for us on our grained work:

Original time ..... **11 days**
Present time ..... **2 days**

The following schedule shows how an article can be put through all the operations of graining in two days:

First Day

Clean and putty.

Second Day

Sand and prime; quick primer.
Sand and fill; quick filler.
Sand and ground coat; lacquer.
Sand and grain; oil graining color.
Apply rubbed-effect lacquer as soon as graining operation is completed.

All of the operations listed under the second day can be done from starting time in the morning to quitting time in the evening. Production, however, controls your schedule. The volume of business may require some juggling of operations, so that work

will pass through the finishing department in a steady flow. This also is a problem for the foreman, but the schedule I have shown works successfully. It works excellent on special jobs, where the order is for one article only—say, one of those matching-the-customer's sample jobs that you get on Wednesday and have to ship on Friday.

Type of Materials Used on These Fast Schedules

Now if you have read this far, you are probably wondering what kind of materials I use to obtain these quick results, and whether they are baked or air-dried. Here is the answer:

I use an oil-base putty that air-dries overnight. The primer and filler are air-drying synthetics. The lacquer is a standard automobile grade. The clear lacquer is sprayed on the same as ordinary lacquer, and it dries with the rubbed satin effect. This last is the lacquer I use over the grained work. One more item now, and this article is done.

Sometimes we have to finish a product in one day. When that is required, it more than likely upsets the foreman. It used to do that for me because, until recently, I had nothing that worked satisfactorily. The advent of the quick primers and surfacers put ideas into my head.

Quick-Drying Putty Needed

It was within reason to argue that if the paint company could make successful primers and surfacers that dried in 30 minutes to one hour, they could also make a putty with the same drying characteristics. I asked the salesman about it and he worked with me on the problem. Several samples were tried and they all worked to a certain degree of satisfaction, the only difficulty being that it required considerable skill to apply the putty.

All that is necessary is to keep driving for that putty and we will eventually get it. As it is, the samples I have tried make it possible to actually, when it is necessary, putty, prime, fill, lacquer and decorate all in one day; or putty, prime, fill, ground coat, grain and lacquer in the same time. These one-day jobs, though, are the exception. However, it is well for the foreman to know how to do them in case he has to.

Bulletin of Cooling Controls

A new bulletin or an 8-page catalog section, just published by Sarco Co., Inc., 183 Madison Ave., New York, N. Y., illustrates and describes control instruments for use in connection with the operation of air compressors, degreasers, air-conditioning equipment, etc.

Despatch Oven Co. Reports

At the Despatch Oven Co.'s stockholders annual meeting, the following officers were re-elected for 1940:

A. E. Grapp.....Pres. & Treas.
H. L. Grapp.....V. P. & Gen. Mgr.
G. C. Keys.....V. P. &. Chief Eng.
F. H. Faber.....Sec. & Sales Mgr.

Remarkable progress during 1939 was summed up at the meeting as follows: 1) Increased sales which were more than double those of 1938. 2) Increased number of offices to give better service to customers in all parts of the United States. 3) The new Despatch indirect air heater was completed and announced to the trade. Sales far exceeded expectations. 4) The new Despatch direct air heater, with the new controlled combustion feature, was announced to the trade. 5) Despatch built what it believes to be the first genuinely streamlined industrial finish baking oven. This oven is now in the Allison Engineering Co.'s plant at Indianapolis. 6) Research on other projects is progressing satisfactorily.

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BY THE MAKERS OF JOHNSON'S WAX!

an enamel that dries with a WAX finish!

Smoother Surface—Due to the wax content, Johnson's Wax-O-Namel provides a smoother and more mar-resisting finish, a deeper lustre.

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"Wax-O-Namel contains Wax. It gives a more beautiful, longer-lasting surface—adds eye-appeal—and, because of its mar-proof quality, definitely reduces 'rejects' in manufacturing."

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Please send me without cost or obligation, complete information about the revolutionary new enamel—Johnson's Wax-O-Namel.

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*City*_____ *State*_____

IT IS SMART AND PROFITABLE TO *Recover Used Solvents*

In this last half of our 2-part article on solvent recovery stills the author briefly describes four types of stills suitable for this work, and adds few final remarks on fire hazards, and the care of equipment for cleaning solvents.

BY D. G. MILLER
Barnstead Still and Sterilizer Co.

THE STANDARD STILL will reclaim practically any kind of low-boiling solvent with entire satisfaction. Lacquer thinners, carbon tetrachloride, trichlorethylene, alcohol, etc., are usually handled in this type of still. These low-boiling solvents are usually expensive, so the savings through recovery are most attractive. Fortunately, they can be reclaimed perfectly with the simplest type of solvent recovery equipment, which further enhances the desirability of recovery.

The standard or atmospheric type still may be employed in almost every case. The equipment operates on the simple basic distillation principle. The initial cost is low. Operation is simple, requiring little attention. Used solvent is fed into the evaporator of the still through a filling funnel, or continuously from a storage tank. After the heating medium is turned on, the solvent vaporizes and passes into a water-cooled condenser where it is condensed. The solvent then passes through an auxiliary cooler from which it is delivered, clean, cool and ready for re-use. Means of flushing or cleaning the residue from the evaporator are provided.

Care should be taken not to charge the still beyond its proper batch level. A gage glass is usually provided with the still to indicate the solvent level. This type of still is designed to operate at atmospheric pressure. Sight glasses are desirable to permit observation of the solvent during operation. The still is heated by passing steam at suitable pressure through a coil immersed in the liquid. Direct-fired gas or electrically heated models are available, but are not recommended for use with inflammable solvents.

Gas and Electric Heated Solvent Recovery Stills

The gas or electrically-heated recovery stills may be used if steam is not available and when non-inflammable solvents such as carbon tetrachloride, trichlorethylene, etc., are to be reclaimed. Operation is the same as with steam-heated models except that a gas burner or electric heating elements replace the steam coil. Care must be taken not to let the still boil dry. In fact, to protect the still, low liquid level control is usually built into a gas or electrically heated still. When

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For use over colored enamels

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Can be used directly on polished metals

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Impervious to atmospheric conditions

Resistant to handling, buffing, tarnishing and marring

EGYPTIAN FINISHING LACQUERS are extremely durable and may be either air-dried or baked.

Ask for further information

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Ask for details

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the liquid in the evaporator reaches a level that is low enough to endanger the heating units or the evaporating chamber, this low level control automatically shuts off the gas or electricity. An automatic shut-off that stops the operation of the still when the batch is completed may be provided.

Sparge Type Stills

High-boiling solvents such as all grades of naphtha, kerosene, gasoline, etc., can be reclaimed with sparge type stills. Steam is necessary for their operation, but comparatively low-pressure steam is used. For this reason sparge type stills are also used with lower-boiling solvents when only very low-pressure steam is available. This type of still is fitted with two steam coils, a closed heating coil and an open live steam coil.

Operating a sparge type still is simple enough but requires a little more care on the part of the operator. The evaporator is first charged with a batch of dirty solvent; heat is applied for 15 to 20 minutes by the closed steam coil. The sparge steam is then slowly admitted through the open coil and after a few minutes it is increased until distillation proceeds at rated capacity.

The purpose of the open or sparge steam is to induce vaporization of the solvent at a temperature below its atmospheric boiling range. This open steam is introduced at the bottom of the solvent and as it passes up through the solvent, it carries the solvent vapor over into the condenser. The steam and solvent vapors are condensed and cooled jointly and are then delivered to a separator where the water and recovered solvent are separated by gravity. The recovered solvent is delivered from the separator ready for re-use and the water condensate passes to waste. Obviously, this type of still can be used only with solvents that are not miscible with water.

Sometimes the solvent recovered by the sparge method is slightly cloudy. This is due to traces of the water remaining in the solvent. This moisture may be removed from the solvent by inserting loose toweling or similar type of cotton cloth in the top of the separator. The cloth may be dried from time to time and then used again. In most cases, the solvent is sufficiently clear without the use of toweling. Sparge type stills are usually of small or moderate capacities.

Vacuum Type Stills

Vacuum type stills often show even greater economy than sparge type stills in the recovery of naphtha, gasoline and other high-boiling solvents, particularly when large quantities of solvent are reclaimed. In this type of still, the solvent is heated under reduced pressure and at the lower pressure the boiling range is brought down to still temperatures that can be easily obtained. For example, a gasoline with a normal boiling range of 370° to 425° F. will boil at 220° to 275° F. under a partial vacuum. To operate a standard still at 370° to 425° F. would necessitate the use of heating steam at excessive pressure (more than 200-lbs. per sq.in.). However, the temperature of 275° F. or less, required by the vacuum stills, is provided by steam available in most plants.

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Vitra-Carlite HAMMERKRAFT is made in Vitra-Carlite quality—well known for its excellent durability, adhesion, flexibility and heat-resistance. Like Vitra-Carlite, HAMMERKRAFT may be baked on a short schedule (300° F. for 20 minutes). ***One Coat Finish, requiring two spray operations but only one bake.*** Gives a beautiful, smooth, hammered-effect surface—easily cleaned.

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HILO

In general, vacuum still installations are continuously operating units of large capacity. Operation is largely automatic. Used solvent is drawn into the still from a storage tank. A float feeder valve automatically controls the solvent feed and maintains the proper liquid level in the still. The equipment is evacuated by a dry vacuum pump and the steam to the closed heating coil is turned on. The solvent vapor rises, passes through the condenser and then flows into a clean solvent receiver which is also maintained under vacuum.

When the recovered solvent in this receiver reaches a predetermined level, a pump is started automatically to deliver the recovered solvent to a storage tank. The wet pump, which handles the solvent, operates intermittently, starting automatically when the receiver is filled, and stopping when a predetermined quantity of recovered solvent has been pumped to the storage tank. The high and low liquid-level controls are vapor-tight float-operated mercury switches. A third such switch is provided for protective purposes; it shuts down the vacuum pump in event of failure of the high-level switch.

When the quantity of solvent to be handled does not warrant the installation of a continuous operated unit, a batch type still may be employed. The batch type unit is charged manually with used solvent, and both the still and clean solvent receiver are evacuated by a dry vacuum pump. The batch is then heated and distilled until the receiver is filled with recovered solvent, at which time the vacuum is released and the reclaimed solvent is drawn off. The vacuum type still requires a small amount of steam, and provides very economical recovery with great convenience for the larger plants—or for the smaller plants when conditions warrant the installation of a vacuum unit.

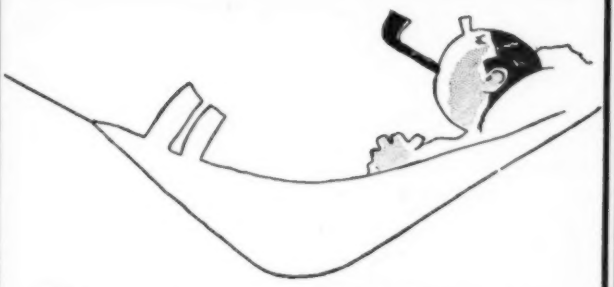
Combination Type Stills

Combination type stills will recover high or low-boiling solvents. They have been developed for plants where a variety of solvents are used. Such a still may be a combination of a standard type and sparge type. It may be charged with low-boiling solvent, such as, ethyl acetate, trichlorethylene, etc., and operated as an atmospheric still; or it may be charged with gasoline or naphtha and operated by the sparge method. Another type of combination unit may be operated as a standard still to reclaim low-boiling solvents, or as a vacuum unit with high-boiling solvent.

Recovery Equipment Does Not Increase Fire Hazard

Whenever inflammable solvents are used, a very definite fire hazard is present. This fact is readily recognized throughout industry, and such solvents are handled with respect and care. The installation of solvent recovery equipment does not add to the hazard already existing. During operation the solvent vapors are fully enclosed. Charging the still or collecting the recovered solvent is no more hazardous than handling, storing, or using solvent. The precautions usually taken in places where inflammable solvents are employed should be followed.

The still should be installed in a well-ventilated place. All wirings, motors, switches, etc., in the



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In our files at this moment is very possibly the formula for a coating which will cut your finishing time, reduce your finishing costs and improve the salability of your product. Many of America's best-known manufacturers use Stanley Coatings . . . attest the potential benefits, to YOU, of Stanley engineering. It's an IDEA. Your inquiry incurs no obligation. And it is just possible that neglect may incur loss. Address Department C—

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room should be of the explosion-proof type, similar to the fixtures employed in lacquer and spraying rooms. Recovery equipment for the average plant takes up little space and is usually installed in a room already properly fitted out. These precautions are not vital to the normal operation of the still, but are to take care of emergencies and should not be neglected.

If some part of the still should break down during operation, it is possible that the room would fill with solvent vapors which would be ignited by any spark or flame in the room. The explosion-proof wiring protects against an electrical spark; and the rigid NO SMOKING rules of the spray room should be in effect around the still. In brief, in every case where inflammable solvents are handled or where solvent recovery equipment is installed, it is recommended that the precautions set forth by the insurance companies and local fire ordinances for the handling and storing of such solvent be carefully followed.

Care of Recovery Still

As with any unit of plant equipment, a solvent recovery still must be properly cared for if best results are to be obtained. The maintenance of present-day stills has been greatly simplified and does not present a problem. Obviously, the oil, dirt, grease or other foreign matter, which has been separated from the solvent, will collect in the bottom of the still. This accumulation must be removed from time to time.

A flush valve is usually provided on the still. If a small quantity of solvent is left in the still, it will flush the residue out through this valve. The operator can soon determine how often his still requires draining. The usual evidence is a marked reduction in capacity or excessive foaming of the solvent. Provisions are also made so that the interior of the evaporator is accessible for more thorough periodic cleaning, during which any heavy or solid material may be removed.

Ease of operation is also an appealing feature. Any helper in the plant can operate a solvent recovery still; usually he needs to devote only a portion of his time to the job. As a general rule, the entire labor cost chargeable to solvent recovery does not exceed one cent per gallon of solvent handled.

Ceramic Ground Coat

The O. Hommel Co., 209 4th Ave., Pittsburgh, Pa., ceramic suppliers, announces the development of a new blue ground coat that embodies all the following merits: A remarkably wide firing range, a smooth satiny finish without excessive gloss, and it is ideal for thin-cover-coat applications. This new ground coat will not burn off at the edges, and it covers even the most difficult of shapes with ease. It eliminates blistering caused by defective steel, and has never fishscaled, even under the most stringent of tests.

Mercury Lighting Bulletin

"Light for Work", is the title of a new 8-page bulletin prepared by The Acme Electric & Mfg. Co., Cuba, N. Y. In addition to describing Acme mercury vapor transformers for indoor and outdoor applications, it explains concisely the characteristics of mercury vapor lighting, the various types of lighting systems for specific and general applications. This bulletin may be of considerable reference value in determining the proper lighting system for your plant, as it includes calculating tables and charts which, when used according to basic rules established, predetermine the necessary amount of light for various types of buildings and work. If you are interested in improved lighting, send for a copy.

Color Printing and Gloss Coating Paper Products

BY R. COMAN SAVOYE

Problems of quick drying to avoid smutting . . and the protection of decorative color work from being soiled or damaged by water, oil, grease, mild alcohol solutions, etc.

TO MOST of those using printed cartons, tags, markers, etc., as well as to the makers of paper and cardboard toys and novelties, it has become quite apparent that something must be done to overcome the smutting or "rubbing" of the ink. In some cases it becomes imperative to have a surface that will resist water, perspiration, oils, greases, etc. Likewise, a high or medium gloss is desired, either over the entire surface or on certain parts of the printing—for protection or to highlight some particular portion of the surface.

By the use of various new vehicles offered by varnish manufacturers, inks to overcome and correct these faults, and having the desired characteristics, can be readily made.

The average printing ink is composed of pigment ground in litho-varnish of varying body, with the addition of driers, etc. These are the present inks that we are interested in correcting, changing, or over-varnishing to make them meet our new requirements.

First, let us take up the hardening of the surface of the printed film. For this purpose we have a simple method, which does not actually harden the film but does reduce tack and prevents offsetting. It is the addition of an anti-offset compound directly to the ink in the fountain.

We can buy inks made with the hard-drying ink vehicles, which make excellent inks of the non-scratch letter-press type. Their film is hard, tough and durable. This type of ink may be used on many of the hard shiny surface papers of the glassine, parchment, cellophane and metallic-coated types, where ordinary inks will not adhere. Further resistance to smutting or scratching is sometimes obtained by the addition of a small amount of non-scratch compound to these inks.

For this same purpose, there is a varnish known as "speed-up heat-setting ink varnish" in which to grind the pigment. This varnish is dried to a hard smut-free and non-offset point as it passes over a gas flame on leaving the press. The printed sheets can be piled immediately without danger of marking, or they can be immediately re-run through the press to print the reverse side. Other methods may be used, but they are all along these same general lines.

Resistant Types of Ink

Next come the more resistant types of ink. For these we often use China wood oil in our grind to impart the desired alkali resistance and water resistance. (I might here mention that, due to the present condition of the wood oil market, many substitutions are being made.) We also have the newer type gloss-ink vehicles, which make inks that have an excellent luster when printed on papers and cardboard made especially for their use.

These inks may be purchased ready for use direct from the ink manufacturer; or those who grind their own inks may purchase the vehicles and grind them either direct from the dry color or from base or flushed colors. If ground directly from the dry color, the material should be ground in a diamond gloss vehicle; then the sparkle-gloss vehicle can be added just before the last loose run through the mill. If the ink is to be made from the base or flushed color, then all that is necessary is to add the sparkle gloss vehicle and run it through the mill once, loosely.

Using this same type of ink with a small percentage (say about 2 to 3%) of chlorinated rubber in the grind, we can sometimes get moderately good results on regular paper and board stock other than the specially prepared types. These inks are very resistant to the absorbtion of moisture, grease, etc., and, where an all-over run of color is used, they form satisfactory resistance to these elements.

Varnish and Lacquer Coatings

However, for maximum protection we still have the over-print varnishes, spirit varnishes, and water-white gloss paper lacquer. The over-print varnish is run on the regular press, the same as an extra run of ink. It may be spot printed over only certain portions of the surface, or a solid plate may be used and an all-over solid gloss will be obtained. Either wood block or copper plates may be used.

These varnishes vary in gloss and drying. They can be supplied in a finish suitable for labels which are to be imprinted later, or they may be had in the odorless and non-toxic type for use on food containers, etc. They should be considered from all angles and your supplier should be consulted for his recommendations.

Those having the higher gloss usually require a little more care in handling both on the press and later in stacking. Sometimes a non-offset spray helps to allow a little higher piling without danger of adjoining sheets sticking together. However, a little care and attention to the supplier's recommendations will enable you to readily overcome any trouble

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Each succeeding year, adhesive tapes assume greater responsibility. These tapes are used for all-'round protection of edges and surfaces, for masking purposes, to prevent scratches and chipping, hold movable parts in place, and for protection in transportation.

Our laboratory will help solve any special tape problem, without obligation

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NEW BRUNSWICK, N. J.

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The Paper Backed Tape

★JONFLEX
Fine Cloth Tape

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Coarse Cloth Tape

UTILITAPE
Waterproof Cloth Tape in Standard Colors

ELECTAPE
With Flexible Bakelite Coating

★METACEL
Metal Foil Backed Tape

TEXCEL
Transparent Tape

•

Samples on request

that may develop. In return for your extra effort you get a surface with a high or medium gloss as desired—one that readily resists dirt of all types and one that can be easily wiped clean with a damp cloth.

Oven Drying the Coatings

Next we come to the spirit varnishes which are generally all-over coatings. They are applied by roller varnishing machines of various types. The coated sheets may be racked to air-dry, but are usually run through a conveyor oven or hot compartment. Most of these ovens are steam heated, although some are heated electrically and occasionally a circulating heater is used.

The usual oven includes a horizontal set of steam pipes with a conveyor running over them. Another type, used where it is desirable to move the coated sheets from one floor to another while drying, is the vertical conveyor on which the racks or shelves are synchronized with the machine so that each shelf takes a sheet as it comes from the rollers. In this case the steam pipes are run vertically and the oven enclosure is built around them, with an air trap at the top end to conserve the heat. With this type oven, the coated sheets can be moved up or down a floor or more, while drying. Then, by allowing a few seconds for the coated sheets to cool after leaving the oven, they can be automatically piled directly from the conveyor and are ready for the die cutter.

Spirit varnishes are usually of the gloss type, although at least one such material is made in a dull luster and is used as a coating for the under side of carton stock before imprinting, to prevent grease and oil from striking through and marring the finished job. These varnishes, like the over-print varnishes, give a surface that is hard and glossy—one to which dirt does not readily adhere and which can be easily wiped off if it should become soiled.

Finally, we come to the newest of the gloss finish family, the water-white gloss paper lacquer. Where exceptionally high gloss, mar resistance, and paleness are desirable, this is probably the best item to use. It has great depth of film, is odorless and non-toxic—which makes it particularly suitable for food containers, cartons, etc. It's resistance to moisture, grease, essential oils, gasoline, weak acids and alkalies is also an important factor under certain usage.

Lacquer for coating paper is generally applied and handled as just described for the spirit varnishes. It is non-thermoplastic so that after piling there is no danger in its becoming tacky or gummy in moist or humid weather or storage.

Free Book; Aluminum Protection

A simple, inexpensive, effective process for the protection of aluminum—The Pylumin Process—is described and illustrated in a new booklet now ready for free distribution by the Pyrene Mfg. Co., 560 Belmont Ave., Newark, N. J. The Pylumin Process furnishes a corrosion-proof base for paint finishes or for the protection of unfinished aluminum parts. Instructions for the operation of the process are also included.

The Fifth Annual Forum of the Porcelain Enamel Institute will be held at the University of Illinois, Urbana, on Oct. 16, 17 and 18, 1940.

Even Barren Sand

MAY BE TRANSFORMED INTO A THING OF BEAUTY WHEN PROPERLY EMBELLISHED

As the sun-kissed damsel glorifies the desert so will the proper finishing materials glorify your product. . . . As a matter of fact, the finish of your product may easily determine the pattern of your sales chart by either skidding into deep valleys or zooming high to establish new peaks. . . . If any product in your line is lagging in sales, why not consult us regarding a new sales-stimulating finish? We have a creative studio that is at your service without cost or obligation.

ROCKFORD VARNISH COMPANY

Manufacturers of Finishing Materials

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NO TAMPERING WITH QUALITY

Bronze Finish on Steel Stools

In reading your INDUSTRIAL FINISHING magazine monthly, we realize that you have been a great source of help and a clearing house of advice to numerous manufacturers. As we have a problem on our hands, we are taking the liberty of writing you for advice.

We are sending you, express prepaid, a model of a bar stool which we are experimenting with. It is made of hot-rolled steel, that we do our forming on. This unit, when finished, will have a chromium outside foot rest, which we have omitted from the sample. For the finish, we were hoping to put on a bronze which we thought would be a good color for this particular item.

Our problem is to put on an air-dry finish that will be tough enough to withstand the scuffing and marring which a stool of this kind would get in a bar-room. We thought that if we could put our color coat of bronze over the stool, and then put a tough top coat over this, that this would answer our problem. However, we have been unable to secure a top coat tough enough to withstand this marring. Several manufacturers have been called in, and after experimenting, they have not been able to give us the solution. Would there be anything like a glass-like material, or some other hard finish at a reasonable cost, which we could apply on an air-dry proposition?

We hope it is not being too forward, on our part, by sending this sample to you, but we thought it best for you to see this item, so that you could get an exact picture of what we are up against. After checking same, we ask that you return this to us collect. Your early reply and any help you can give us in this matter will be greatly appreciated.—B. M. Co. (Metal Products).

Questions Answers

Editor's Note: The sample submitted had an attractive, smooth, lustrous, yellow-bronze finish, which was scuffed off in a few places, exposing the smooth black steel surface. Scratching it with a knife revealed the fact that over some areas the coating could be easily stripped off. It didn't chip or flake but peeled off like gold leaf. There was a notable lack of adhesion to the metal. Our suggestions were as follows:

You have probably noticed that the paint doesn't adhere well to the steel. Some areas are worse than others. At one point we peeled off a single sheet of bronze paint almost as large as a post card. You know what that means —unclean metal!

Just before your first coating is applied to a metal surface, that metal should receive a thorugh chemical cleaning and drying—see articles on tear sheets which we enclose with our letter.

Now, with some of these samples, or with sample metal test panels, thoroughly cleaned, try your bronze paint just as you plan to use it. After two or three

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• *Available in most colors, including white, pastels, and clear.*

. . cover effectively the surface defects of rough metal castings in one coat.

. . no need for priming, sanding, removal of welding and tool marks, or other surface preparations.

. . beautiful, economical, durable.

. . various patterns, from coarse to fine.

. . one hour or shorter bake, at low or medium heat.

. . light in body, easily sprayed.

. . easily touched up and patched.

. . good coverage.

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LACQUERS **PIONEERS IN PROTECTION** ENAMELS

days, see if it scrapes off as easily as it does from the sample you sent us. You may have to change bronze paints, or rather the bronze vehicle; you may even have to use a thin primer coat directly on the metal before applying the bronze. However, the proper kind of bronze paint should adhere satisfactorily to clean metal. You or your paint supplier can determine this by making some tests.

No top coat that you could put on this bronze coat would help to hold it to the metal, as it is now. You must have perfectly clean metal surfaces to make any kind of paint stick to them. Really, the top coat is less important than the first coat.

Several companies that advertise in INDUSTRIAL FINISHING make clear top coats that should be satisfactory for your purpose —once you have made your bronze coat adhere firmly and permanently to the bare steel.—ED.

Rapid Cooling After Baking

The company to whom we are selling a red dipping enamel are coating bars of channeled steel approximately 6-ft. in length and 2-in. in width. We would like to have information as to how these articles might be more rapidly cooled by the application of water. In other words, faster drying is desired so that the articles may be packed in less time after they come out of the ovens. We find that the heat of the metal plays a part in permitting the paint film to remain tacky.

If you have had any previous experience with water systems of this nature we would appreciate that information. Also, if you can refer us to companies who might specialize in the manufacture of such equipment we should like to know their address.—H. Mfg. Co.

EDITOR'S NOTE—*One of the companies to whom we submitted this problem, has written H. A. Mfg. Co. as follows:*

We think that we may be able to help you if you can give us some additional information. Can you tell us—

1) The length of the chain between the oven and the place where you do your packing.

2) The speed the chain travels.

3) Temperature of the oven.

4) How long the objects remain in the oven.

5) What the minimum time is which you can allow between the oven and place of packing.

We are sending you our Nozzle Bulletin No. 250, together with a price list covering same, and it is our opinion that with the above information we can recommend the proper cooling nozzles for your use.—BINKS MFG. CO.

Vanishing Paint

Can you tell me of any firm or person manufacturing or having a formula for a vanishing or disappearing paint? This material is to be applied and used as a means of identification on varnished pieces of metal. The material can be of any color and should hold its color for approximately two weeks; then, through oxidation, it should lose its color in about two to four weeks.

The reason for using this type of paint for identification is be-

We call it the "500" Line—
Furniture men call it the BEST *line!*

Sorry! We haven't yet christened our new line of lacquer finishes for fine furniture. Confidentially, the reason is that every customer who has tried it has his own suggestion for a name that means "superb," "unexcelled," "economical"—in short, the BEST they've ever used.

Until we decide which to use, we'll have to talk about these sensational new products by their laboratory designations, as follows:

594 LACQUER SEALER **595 GLOSS LACQUER** **596 FLAT LACQUER**

They combine superb clarity with unprecedented toughness, resistance to marring, printing, alcohol, water, hot oil, and extreme temperature changes. They're free spraying, smooth flowing, clear rubbing. And they give the finest results you ever saw!

Why not join the increasing number of furniture manufacturers who are using this new line? Then, perhaps, *you* can suggest a name that will properly describe its excellence.

THE GLIDDEN COMPANY
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TIME-TESTED
GLIDDEN PRODUCTS CARRY THIS FAMOUS MARK OF QUALITY

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Everywhere on Everything

cause due to such fast production and shipping we cannot use any manual means for removing same. At the same time there must be no color, other than that specified by the customer, on the metal. The identification mark is to be about 1-in. square on all pieces. This varnished metal is stored in an open part of the mill for about two weeks prior to shipping.—C. J. M.

We have never heard of such a material. One of the local paint chemists suggests the use of a fugitive analine dye (the most fugitive colors being green and blue) with a clear vehicle such as varnish, shellac or lacquer. Perhaps one of the paint and lacquer chemists who is familiar with analine dyes could formulate something that will meet your requirements.

Has any reader some suggestions to offer?—ED.

Spraying Filler

I do not agree with the article in the February issue, on the advantages set forth in the spraying of wood fillers (article beginning on page 73). I cannot see any saving in labor or material, or any benefit in the results obtained. Take, for instance, the spraying of an 8-lb. cut of filler, used on open-grain wood. Mr. Chester, the author, states that it is necessary to brush and hand pad the tops to avoid pinholes and shrinkage. If this is necessary on the tops, then it should be necessary on the under parts also, especially on all good furniture.

Since costs always enter into all operations, one should consider the labor of straining the material so that it will spray properly. Then there is the cleaning of strainers, agitators, fluid hose, air guns, spray-booth table, fans and other equipment. There is the cost of equipment and the electric power and air pressure necessary for spraying.

Wood fillers are made up of inert materials and colors, incorporated with liquids; and since the fillers must dry hard and fast, the liquids must contain a great deal of drier. Because of these fast-drying properties, filler has a tendency to clog strainers, fluid hose and spray guns more than other liquids that are sprayed.

If a special filler were made for spraying—one that was longer in oil and ground fine through a stone mill—it would spray much better. However, the cost of such a filler, together with the excessive waste of material in spraying, especially on small parts like legs and spindle work, would greatly increase the costs.

In view of these facts, I believe the usual method of applying wood fillers by brush, is cheaper, more efficient, and requires less labor than spraying.—GEO. MACDOUGALL.

Finishing Alder Wood

The following letter is from C. J. M., in B. C., Canada, whose question about finishing alder wood was published in Feb. 1940 issue, page 77.—ED.

Dear ED: I received your letter and I thank you for your suggestion about using a shading stain on the lighter parts of the alder. However, this would not be very practical, owing to conditions under which I am forced to work at the present time. Since we use

a very low grade of wood, we would have to shade it all over, and we would be much better off by using a non-grain-raising stain, which I do when a better class job is required.

As to the cheaper work, well I have tried all the pigment stains of the concerns you mentioned in your letter, but, Mr. Ed., they just don't work. In fact we had a service man here from one of your big U. S. finish manufacturers last week. He said we should use a glazing stain directly on the wood, which would do away with the smudge. Next day he came back with the glazing stain, but it didn't work satisfactorily at all. In the first place, it didn't stain the wood; it just put a glaze on it. Second, it did smudge. Third, it would require quite a skilled hand for wiping in order to match one piece to another. Also, color sealers or shading stain on top of that, and the cost of the job would jump.

Now, referring to your second letter, wherein you receive a suggestion from Mr. J. G. Low of Seattle [published on page 77, Feb. issue]. I tried this wash coat of colored shellac; then used oil stain, sanding sealer and a thin coat of shellac; then varnish. But even that does not do away with the smudge. It also makes the work very much lighter in color and off tone. However, I want to thank you both for the trouble you have taken in trying to help me out. I think my own system is much better and cheaper. After all, I haven't any really great trouble in turning out a decent job.

I came out here four years ago from Eastern Canada where most of the work is hardwoods. I might say that I learned the finishing trade the hard way too. I worked in the U. S. A. from New York to Florida, but never came in contact with alder wood until I came here, and what a headache it was for quite some time. I tried all the old tricks I knew and some I didn't know. Like most finishers, I hate to be licked.

I felt that there must be a way to do the job, and it had to be a simple easy way, so I called in salesmen and service men from all of the local paint concerns and told them what I was up against. Well, in a few weeks I had enough samples of stain to stain the whole town. However, they just didn't work and, believe me, I was plenty worried. There is no trade in the world that causes more worry than the finishing trade—and more so in a small factory where one has to do most of the worrying and work himself, and try to compete with the larger concerns as regards price and finish.

Finally, I wrote to one of the U. S. concerns whose stains I had used in the east for years. Since that time my hair is not so gray. However, that alone did not solve my problem. I found that my next big problem was in the cabinet shop, where all too often there is a lack of skilled help—and more so in the sanding department where a scuff and a lick and presto! It was passed on to the finishing department where a little stain and varnish are supposed to perform miracles. Accordingly, I set out to reform the cabinet shop, and what a fight I had on my hands. I became public enemy

No. 1 in that establishment.

Now this is the way I finish alder: First, see that the wood is sanded perfectly smooth—almost to a polish. Second, use a good grade of a mild pigment oil stain; let dry overnight. Third, one coat of colored sealer or shellac. Fourth, sand; then coat with varnish or lacquer.

For higher grade work, I apply a light coat of non-garin-raising stain; wash-coat sealer, dry one hour; use same pigment oil stain thinned down as glaze, dry three hours; then one coat of sealer, sand; and varnish. This gives a clear and pleasing job.

The main reason why I wrote to your magazine about finishing alder was because there are several concerns advertising pigment oil stains. But I have learned that they just don't work under certain conditions. We even use the same system on unselected spruce wood and it does a fair job.—C. J. M.

We are glad to learn about C. J. M.'s experience. If some reader knows of a better way to finish alder, or a different way that produces satisfactory results, we would like to hear about it.—ED.

Cleaning and Finishing Machine Parts

(Continued from page 16)

As the loaded racks are ejected from the baking ovens, the material passes to a cooling area where it is allowed to cool to a reasonable handling temperature. The oven will hold 16 of these racks in each of its two sections. Heat for baking is controlled by a temperature controller, and the time of baking is controlled by the IBM program controller.

Overhead Monorail System Moves Materials Efficiently

One thousand feet of overhead monorails facilitate handling the materials from the entrance of the department to the spray booths and ovens, and on to the point where the material is ready to be delivered to store rooms or assembly departments. Due to the large variety in sizes of parts, racks with removable trays have proved to be the most economical way of handling this material. The racks are so designed that trays may be spaced at intervals of 6-in. or more, depending on the size of the parts.

One important aspect of IBM's metal finishing department, which stands out foremost in the visitor's memory, is the attention paid to the safety and health of workers. Promoted periodically by safety campaigns and literature and suggestion contests, as well as through daily vigilance, every detail of operation has been carefully planned to increase safety and to promote good health.

The water-wash spray booths, indirect lighting, completely tempered filtered ventilation, and general working conditions not only promote safety, but an atmosphere in which men can work with many of the comforts of home. And, as safety statistics prove, the men of this department are safer at work than they are at home!

A small machine has been developed for washing the rollers used for graining where the work is done by hand. This equipment speeds up work 200%.

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THRESHER PIGMENTED Wiping Stain— Series 400

A new development in finishing materials. They offer: Increased adhesion, exceptional clarity, easier working properties, better color uniformity and excellent non-settling properties. Less cost per unit.

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PAINT—VARNISH—ENAMEL—LACQUER

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cannot be marred or scratched

A lacquer finish that cannot be marred or scratched with the thumbnail, or other destructive agencies—a much tougher piece of goods than the ordinary lacquers. It produces a splendid transparent finish of full depth on maple, walnut, gum, mahogany and other cabinet woods . . . It is made in either the Clear Gloss Rubbing or the Satin Finish. Mar Proof Lacquer Sealer is recommended for the first coat.

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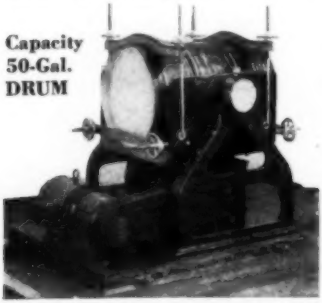
SAVE 60%
PAINT HANDLING COSTS

Here's a 50-drum agitator for industrial use. Paint materials rejuvenated without opening barrel. Twenty-six in use by one company in their various plants, saving 60% in handling and preparing paints for circulating system. Write for details and price.

Capacity 50-Gal. DRUM



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Ken-Wood Bleaches
Create Distinctive New Finishes
New Bulletin on Wood Bleaches
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HOT LACQUER UNIT

Complete with circulating pump, thermostat, thermometer, pressure maintaining valve, gauges, and control switches; fully automatic. Portable.

Send for literature.

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New...

MATERIALS SUPPLIES EQUIPMENT

Paint Stripper and Metal Cleaner

Compounds for quickly and economically cleaning metal surfaces preparatory to finishing, are announced by D. C. Cooper Co., 20 E. 18th St., Chicago, Ill. Materials are available for stripping off coatings of baked enamel, and for cleaning the usual shop grease and dirt from new metal parts. These materials come in crystal form and are dissolved in water according to directions given by the manufacturer.

New Drying Lamps

Four new infra-red drying lamps in 250 to 1000-watt sizes, designed for industrial or commercial drying and heating jobs, are announced by the Westinghouse Lamp Division, Bloomfield, N. J.

The new line includes a 250-watt lamp with pear-shaped clear glass bulb and medium screw base; a 250-watt reflector drying lamp in the familiar inside-frosted R-40 bulb, also with medium screw base; and 500 and 1000-watt lamps in clear glass, globular bulbs, both with medium and bipost bases, for heavy duty work. All are designed for use on 105 to 120-volt circuits. With the exception of the reflector drying lamp, all should be used in conjunction with especially designed aluminum or gold-plated reflectors.

The reflector drying lamp is a self-contained lamp and reflector, incorporating a metallic reflecting coating which is applied to the inside of the

TOUSEY . . *Announces a New Development in Finish*

No. 61 WHITE BAKING DURACOTE

Has a baking time of 20 minutes at 325° and despite the fact that it has a high gloss, is extremely hard and highly resistant to scratches and marring, it positively is not brittle.

Prices and samples will be furnished on request to the

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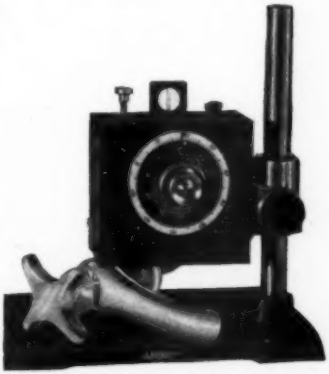
Varnishes—Enamels—Lacquers—Synthetics : Since 1885

specially shaped blown glass bulb, then hermetically sealed in the bulb, and thus protected from dust, dirt, moisture and deterioration.

Rated laboratory life of all the new drying lamps is in excess of 5000 hours, hence they are expected to prove economical and advantageous for many drying and heating operations including the drying of enamels, lacquers and paints.

Measures Thickness of Paint Films

The Magne-Gage illustrated here can be used to quickly and accurately measure the thickness of finished coatings (which are non-magnetic) on iron and steel surfaces. The method used is based on the decrease in magnetic attraction resulting from the interposition of any non-magnetic material between a magnet and a steel base. A magnet exerts its maximum attraction when it is in direct contact with iron or steel. If any non-magnetic material, such as zinc, cooper, enamel, etc., is placed between the magnet and the steel, this attractive force is decreased to an extent that depends



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Hot Lacquer?

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Flat Lacquer F-1656

Gives You 32% Solids at the Gun!

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- One coat produces a high build, beautiful finish.

Economy Noroy Flat Lacquer F-1616 with 21% solids for low cost production.

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127 MAIDEN LANE
NEW YORK CITY

Factory . . . Rahway, N. J.

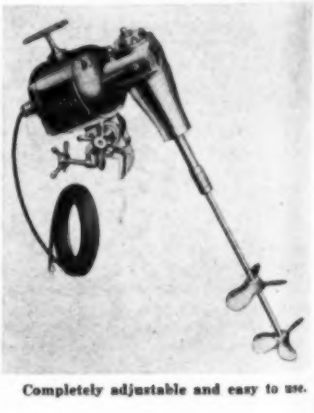
upon the thickness of the intervening layer. If a device with a permanent magnet is calibrated with non-magnetic coatings of known thickness on steel, it can be used to measure the thickness of other coatings.

In this method, a large attractive force corresponds to a thin coating and vice versa. The dial of the Magne-Gage is set to read zero on bare steel and above 100 in the absence of magnetic material. By this method of setting the dial, larger dial readings correspond to thicker coatings.

Every piece tested is unharmed and ready for use or shipment. This device is a product of The American Instrument Co., 8010 Georgia Ave., Silver Spring, Md.

Portable Mixer

The accompanying cut illustrates one of the Typhoon motor-driven portable adjustable mixers manufactured by The Patterson Foundry & Machine Co., East Liverpool, Ohio. The lower shaft and propeller are made of monel metal. Lubricant from the lower bearing is prevented from escaping by a spring-loaded metallic and Duprene triple seal. The explosion-proof fan-ventilated motor has

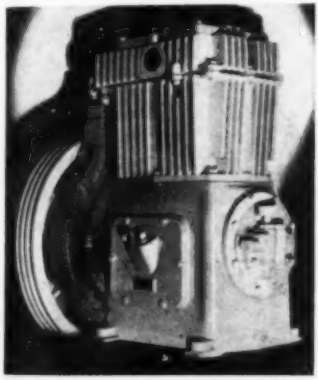


Completely adjustable and easy to use.

ball bearings and, with its toggle switch, is encased inside a chromium-plated solid aluminum shell. Bronze and nickel-steel silent spiral gears, between motor and shaft, are encased in a chromium-plated steel gear case. The clamp is nickel plated.

Pressure-Lubricated Air Compressors

Two new pressure-lubricated air compressors, Models 244 and 340, are announced by the Quincy Compressor Co. of Quincy, Ill. These new compressors are especially designed for heavy duty industrial use. Model 244 is a duplex cylinder, single-stage compressor with a maximum piston



Streamlined in design, and air-cooled.

displacement of 45.7-c. F. M. Model 340 is a 2-stage compressor having 40.0-c. F. M. maximum displacement, and is recommended particularly for services where air at higher pressures is required. The new modern design introduced by this company on its line of air-cooled compressors in 1939 has been incorporated in these two larger models.

Lubrication is furnished by a gear-type pump which supplies oil under pressure to the connecting-rod bear-

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CLAREMONT, N. H.

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AND COMPLETE FINISHING SYSTEMS

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GEORGE KOCH SONS, INC.
EVANSVILLE, INDIANA
MANUFACTURERS OF INDUSTRIAL OVENS AND COMPLETE FINISHING SYSTEMS

ings and piston pins. The oil pump is mounted on the end of the crankshaft. Main bearings are Timkens, lubricated by a splash system which functions separately.

Other features include unbreakable ring-type valves made of a special valve steel. Each valve can be removed for inspection without disturbing the other valves. Remarkably cool operation is assured by deep vertical fins on the cylinders, which increase the radiation area 12½%, and over which air is directed by a combination fan and flywheel. The 2-stage model has a large copper-finned intercooler to assure maximum temperature drop between the low and high pressure cylinders. When Models 244 and 340 are desired for automatic start and stop service they can be equipped with Quincy's patented Loadless Starting feature.

"Fabri-clean" Cleaner

"Fabri-clean" is the name of a new product the purpose of which is to clean fabrics. When applied to any soiled fabrics, it quickly and thoroughly cleans without leaving rings or any traces of the cleaner. It is non-inflammable, speedy and thorough; is designed primarily for use in manufacturing plants where upholsterers invariably make and leave finger marks or other spots on new pieces; leaves neither odor or residue on the surface; a product of V. J. Dolan & Co. Inc., 1830 N. Laramie Ave., Chicago, Ill.

Humidifying Systems; Bulletin

An adjustable automatic humidifying system that can be adapted to the requirements of practically any industrial plant—for small areas or large—is described and illustrated in a new 6-page bulletin printed in black and red, and distributed by Spray Engineering Co., 114 Central St., Somerville, Mass. The bulletin is entitled "We Improved upon the Camel—To Cross Industrial Deserts." The illustrations and information are of interest and value to every individual in every industrial concern.

Letters from I. F. Readers

(Continued from page 8)

more direct and accurate information if you will refer this particular problem to one of the many competent engineers connected with the several heating, ventilating and dust-collecting manufacturers and contractors in your city. (St. Louis, Mo.).—ED.

Gilding

We do not do our own gilding. It is sent out. We have, however, a man in our shop who is eager to learn. We would both benefit. We have already purchased all the required materials, agates, etc., and he has been doing some experimenting in his spare time.

Do you know of any book that covers this art? How about getting one of your contributing ediotrs to write you an article on the subject? We feel it would be interesting to many. —F. & H. Co.

We know of no up-to-date book on this subject, but we have published a few articles about gilding in past issues of INDUSTRIAL FINISHING. If something more becomes available, we will present it.—ED.

Wood Patching; Crack Filler

I notice an item on wood patching in your January issue. I am interested in securing the names and addresses of firms who manufacture a crack-filler that will dry hard without shrinkage, and receive the stain placed on the adjoining wood.—N. S.

Please advise sources of supply for wood patching material, as outlined on pages 80 and 81 of January issue of INDUSTRIAL FINISHING.—B. Furn. Mfg. Co.

We are interested in getting the names of manufacturers of crack filler. We have used some plastic wood but it is not entirely satisfactory. We have also used car-creek, but if there are better materials, we would be glad to know of them.—A. B. C. Co. (High Grade Caskets).

In the January, 1940, issue, Question & Answer Dept., we notice that one of your readers wrote you regarding wood patching. In your reply to him you stated you were sending him a letter with the names and addresses of several manufacturers of excellent crack filler, made espe-

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INDUSTRIAL FINISHING
222 E. Ohio St. Indianapolis, Ind.

cially for wood repairs. We would appreciate it if you would mail this list to us, as we also have had difficulties in securing a satisfactory crack filler.—R. M. Co. ("From Standing Timber to Finished Product").

Information furnished.—ED.

"Heresite"

Please give me any information you have concerning "Heresite," a coated metal flue pipe. I am interested in the manufacturer, type of coating, method of application and maximum operating temperature. Any additional information, which you have that you believe will be of assistance to me, kindly forward.—J. D. S. (with Gas Co.).

We refer you to the Heresite & Chemical Co. (Mfrs. of "Heresite"), Manitowoc, Wis.—ED.

Liquafill, etc.

Will you please advise us the name and address of the concern that manufactures coagulants? The material we desire is used much the same as a glue size on wood, but it is quicker drying and does not have the tendency to open glue joints and raise veneer. This particular company was located in Ohio. All names of firms making material with above characteristics will be very welcome. —H. A. Co. (Cedar Chests)

We believe that the concern you have in mind is the Liquafill Mfg. Co., 823 Richard St., Dayton, Ohio, (Attn: Frank V. Tischer).—ED.

Brass Grilles

On page 12, of February issue of INDUSTRIAL FINISHING, you discuss brass grilles in connection with new furniture. Will greatly appreciate getting the addresses of manufacturers of such grilles—T. C. Co. (Distinctive Occasional Furniture)

Magnetic Stenciling

On pages 38 and 39, in the Equipment Review Section of INDUSTRIAL FINISHING for February, in the paragraph entitled "Infra-Red Ray Tunnel," there is one sentence that interests us. "An entirely new high gloss enamel has been developed for this magnetic stenciling process."

Will you kindly send us as much information as you can about this magnetic stenciling process?

You did a fine job on this Equipment Review Section.—R. Mfg. Co.

Infra-Red Ray Devices, who sent in this item, gave no additional information about this, so we are writing them in reference to it.—Ed.

Graining Transfers

I noticed, in September 1939 issue, a letter about a transfer graining paper for wood grain, and reproduction on metal. I would appreciate it if you would forward these same names of manufacturers to me, as I have been looking for something of this type for a good while.—M. M. Co. (Metal Products).

We are interested in "Graining Paper," as described in the O. Leistner, Inc., letter, published on page 4 of the January 1940 issue. We would appreciate it, if you would convey this information to them, and arrange to have them send us a small sample of their material, together with samples of colors for various walnut grains.—E. Mfg. Co.

We are interested in the names of some manufacturers of a transfer graining paper on plastic material. We have noticted this request from another reader of Industrial Finishing.—G. D. Co. ("Trimmings That Sell Your Products").

Solvent Recovery

Will you please give us the address of the Barnstead Still & Sterilizer Co., whose representative wrote the article on reclaiming used solvents, which appeared in Feb. issue, beginning on page 14?—V. K. Co. (Vacuum Dry Kilns)

The company's address is 6 Lanesville Terrace, Forest Hills, Boston, Mass.—Ed.

Watson-Standard Appoints New York Representative

The Watson-Standard Co., Pittsburgh, Pa., has appointed Technical Paint Products Co. as its metropolitan New York representative. The Technical Paint Products Co. will handle not only the Industrial and Trade Sales, but also the Watson-Standard industrial finishes and product finishes.

FORM-A-ROC

We offer to all industries equipped for baking finishes this highly perfected, heat-converting, synthetic enamel.

FORM-A-ROC

We have combined to an optimum degree the necessary qualities of tremendous hardness, great adhesion, smooth lustrous gloss, and freedom from haze, discoloration and wrinkling.

FORM-A-ROC

Baking schedule is of great flexibility, permitting from 5-50 minutes at 250-375° F.

FORM-A-ROC

No matter which of the present worthy finishes of this type you may be using or planning to use we sincerely recommend that you investigate

FORM-A-ROC

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5208 Harvard Avenue

CLEVELAND, O.

Industrial FINISHING

Distributed to Executives and Foremen Finishers in industrial plants where finishing coats are applied with finishing equipment.

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EDITORIAL

Better Finishing Equipment Quickly Pays for Itself

* . . . . For example, change from lacquer to synthetics often involves the purchase and installation of such equipment as hydro-filter spray booths, ovens, washing machines and conveyors. Equipment of this kind can be generally paid for by the savings in material, labor and floor space, in from one to two years — in some cases, even less.

The use of synthetics generally involves air-conditioned spray rooms, and practically all recent jobs for high class finishing have been bought complete, including heating and ventilating equipment for the spray room, the water-wash spray booths, washing or rustproofing equipment, conveyor and ovens.

In many of these cases other changes are required in the entire shop procedure, affecting manufacturing and assembly operations, but the progressive manufacturer realizes that constant change and improvement is the life of his business and his product. It is this trend toward complete finishing systems, thoroughly engineered, with each step coordinated and balanced with the entire manufacturing process, that appears to us to be the most important of recent developments.

In the past, most manufacturers have purchased an occasional oven, spray booth or washing machine as required, or as it appeared necessary to them. This practice is rapidly becoming obsolete and is being superseded by obtaining the services of a competent engineer experienced in manufacturing processes, and most particularly in the field of industrial finishing.

We still have small manufacturers who claim that because of the small margin in their profit, or the low price of the products, they are unable to install or pay the price of uptodate production equipment. In practically every case of this kind the fact that the

* Guest Editorial . . . . Many readers can write an excellent editorial — two or three paragraphs presenting a timely suggestion or valuable idea that will stimulate thought on a live subject. The Editor welcomes guest editorials and pays for those that are published.

margin of profit is small is all the more reason that modern production equipment for finishing is vitally necessary toward the lowering of costs and the improvement of the product.—W. H.

Our New Foremen Finishers; Where Will We Get Them?

Of the several comments written to the Editor after publication, in the January issue, of an editorial under the above title, here is a letter from a foreman finisher who sets a splendid example by actually training young men to become foremen. He says:

"If every foreman finisher were broadminded enough, he could go a long way toward eliminating the shortage of experienced foremen finishers.

"Here is my plan: I select two or three men from my crew—men above the average in intelligence—and gradually acquaint them with the different procedures, operations and methods in my finishing room. After I have taught them the art of mixing colors and the application and art of finishing, I use one of them as an extra man to fill in when a man is absent or off duty for a short time. In this way he learns how each operation is performed. I use one of these men to mix my stains, fillers, etc., under my supervision.

"Gradually I teach them what I know about handling and supervising labor, and I actually let them direct the men in my department when it is necessary for me to be away from the job for short periods of time. I do all within my power to train them for foremen, for I am always glad to see a young man make good. I take the attitude that if I train a man to be a better foreman than I am, and if the boss wants him to have my job, well maybe he deserves it.

"Within the last two years two of my men have gone directly to other factories and taken jobs as foremen finishers — and they are making a success of it. I think this testifies to the fact that I have, in a small way, been successful with my training. I was glad to see these young men advance in their profession. In fact, I helped them secure their jobs.

"Of course, any foreman finisher dislikes to see a good man leave, but he should give deserving men the same chance that someone gave him, and he should have someone trained far enough along to take these men's places when they get an opportunity to advance.

"Right now I have a young man who, I am sure, is capable of handling a foreman finishers job, and when he gets an opportunity to take a foremanship job, I will have another man to take his place."

For obvious reasons, this foreman doesn't care to have his name published, but the Editor knows

---

I am interested in your editorial on pages 89 and 90, entitled "Our New Foreman Finishers; Where Will We Get Them?" The question raised by J. W. Lippitt is very pertinent and timely. It seems to me that this question could be discussed with various vocational schools located in many cities. A practical course could be outlined that would give young men a good start, to say the least. I would be interested in helping arrange a program of this kind. —G. Klinkenstein, Vice Pres., Maas & Waldstein Co.

---

him personally and knows that what he has written is true and not just a piece of fiction to make "good readin'". We need more generous minded foremen of this type, although it must be acknowledged that some foremen, who are willing to teach bright young men something about foremanship, do not have an opportunity to do so.

Business Trends for 1940

* Study and perusal of the advertising of many finish manufacturers during the year 1939, their extent and their scope, seem to show that there has been a most definite uptrend for that year.

Looking backwards to those leaner years of 1932 and 1933, and comparing them with 1939, we feel a most welcome belief that, as a whole, business in general is on the rise to higher levels for 1940. Yet, this fact must not lead to over-confidence—and will bear most careful analysis.

To have achieved a better business after years of so-called business depression means solely this: If the outlets for finish manufacturers have brought in greater increased volume, then as a natural corrollary, the output of their finished products has also been increased. Which, summed up, means that there has been a greater purchasing power on the part of Mr. John Q. Public.

As a whole, this seems to be a most evident precursor for improved business during the coming year; so it behooves us to carefully lay plans for each individual share of these bettered conditions. This can not be done by sitting supinely by and waiting for business to come of itself into our factories. True, of course, a certain amount will come in, but it seems that the present upgrade may best be taken advantage of if we formulate and put into being intensive advertising plans for 1940.

"As we sow, so shall we reap!"

—C. D.Y.

Finishes on New Furniture Exhibited at Markets

Finishes were not neglected in the January furniture markets. Improvement was general. There were fewer dull, muddy, lifeless finishes and more that brought out the inherent beauty of the wood to best advantage. In addition to improvement in appearance, for the first time there was a definite effort to produce finishes that would better withstand the hazards of service in the average home.

Generally speaking, modern designs are in the lighter finishes and traditional designs in the darker finishes. The full bleach or blond finishes, however, are of decreasing importance. They have been rather lifeless and the marks of service have been disfiguring. Replacing the blonds are finishes of intermediate tones best described as honey tones, although their names are legion. They are

STOWELITE

Heatproof—Rustproof—Acidproof

A coating for metal surfaces. Air dries in two hours; dries immediately when applied to hot surfaces. Will not burn off, chip or crack at a bright red heat; will remain hard enough to resist abrasion and mechanical injury at elevated temperatures. No organic material, no odor and is non-toxic. Immune to acids, oils, gas, ammonia, chlorine, and to corrosive fumes and many solvents. May be brushed, sprayed or dipped.

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The Infra-Red Ray Devices, Inc., the First to sell such equipment, have had years of engineering behind them and handle only **bonafide** 24 karat gold-plated reflectors, giving many advantages over some of the **so-called** infra-red and near infra-red ray. We are bonafide licensees and guarantee the consumer all privileges under pats. 1,998,615 and 2,057,776 held by Ford Motor Co.
INFRA-RED-RAY DEVICES, INC. *The First to Sell Such Equipment*
1225 E. Forest Avenue DETROIT MICHIGAN

used mostly on modern but to some extent on traditional furniture. These finishes are warm and livable and generally show the depth and luster of mahogany and the other fine cabinet woods.

One of the most interesting finishes shown at the market was a soft fruitwood-like finish that might be called "Provencal." It subdues the medium-sized pores in mahogany and is especially adapted to Modern and to simple versions of French Court furniture. Another innovation used both on traditional and modern styles was a dark red mahogany. This is not the dull stain of bygone days but a deep rich color that flashes and glows like the embers of a dying fire.—Mahogany Association.

Quality Finish Failed; Costly Replacement Followed

Do you ever tire of hearing or reading: "Clean the metal surfaces thoroughly before applying finish." "Don't allow cleaned iron or steel surfaces to become even slightly specked with rust before putting on a protective primer coat," etc.?

Mr. J. G. Low of Seattle, Wash., tells us about an expensive piece of finishing, followed by a tremendously expensive refinishing job, that illustrates one reason for finishers insisting upon clean rust-free metal.

MARTIN'S
PRODUCTION PROVEN
— FINISHES —
Finishing systems scientifically developed to meet your specific conditions will (1) Cut finishing cost per unit (2) Save time by reducing the number of finishing operations.
MARTIN VARNISH CO.
900 W. 49TH PLACE, CHICAGO, ILL.

"About six years ago a certain brewery in this state put in an order for five large steel beer tanks for their brewery. Of course, before being put into use, these tanks were to be coated with a well known odorless tank enamel made especially for this purpose.

"The tanks were built and then sandblasted to remove all particles of loose steel, to avoid any possibility of chipping after the enamel had been applied. If beer in the tank should come in contact with bare metal, at any point, the whole batch would be spoiled.

"After sandblasting, these steel tanks were allowed to stand in a cold damp room five or six days before the tank enamel was applied. As a result, a slight disintegration set in that was hardly visible to the naked eye. The fine tank enamel was applied over this. The tanks were shipped and installed in the brewery. Within a few days the enamel began coming off in large chunks, and the

operation of the brewery had to be stopped, at a great cost to the company.

"The tanks could not be refinished in this cold room the way they were sweating, and they could not well be taken outside after having been installed. Tank enamel has to be applied at a certain temperature and burned in with a blow torch for the first coat.

"The company had to have a large waterproof tarpaulin made, cover one tank at a time, then put three charcoal-burning stoves in the tank, dry it out, remove the enamel, sandblast and refinish the tank—repeating this series of operations on the insides of all tanks. Naturally, this refinishing job involved a tremendous cost. A very fine finish that had given perfect results for this work throughout the United States had been misused and put over a surface that was not fit to receive the final finish.

"In the first place the tanks should have been built in a warm place free from dampness, sandblasted at once, and the enamel applied the moment the sandblasting was finished."

Mahogany Furniture Popular at Markets

For the first time in many years, mahogany took the lead as the favored cabinet wood at the January furniture markets recently held in Grand Rapids and Chicago. Mahogany has been gaining steadily in popularity for the past several years. In 1934, surveys reported 20.3% of mahogany shown against 42.3% of walnut. By June 1939, the relative position was 31.7% of mahogany shown and 33% of walnut. In the January 1940 survey, by the walnut industry, of the number of bedroom and dining room suites shown at the Grand Rapids and the Chicago markets, mahogany leads with 35.2% against 32.4% for walnut.

Mahogany maintained its complete dominance in the more expensive types of furniture, largely in reproductions and adaptations of the 18th Century English and American styles. Mahogany gains were outstanding in medium-price furniture where many manufacturers extended their lines and a considerable number of them came to market with mahogany patterns for the first time. Important in this development was the increased showing of bedroom and dining room furniture of solid or lumber construction.

The furniture dealer has slowly become aware that there is a well-nigh universal public sales appeal in the designation "solid mahogany." Solid mahogany also is adaptable to the simpler and less ornate styles of 18th Century furniture that are historically correct only in mahogany. Such furniture has the sales appeal of moderate price, historical acceptance, design of time-proven excellence and solid construction factors, which, together, make the ideal selling combination.

There has been a decided decrease in the showing of furniture of so-called "Philippine mahogany," a controversial trade name for a group of Philippine hardwoods that are in no

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for refrigerators, stoves, table tops, etc. . . . . Chipped and broken porcelain quickly and easily repaired with Star Porcelain Repair. Inexpensive. Needed in every plant. Write for particulars.

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RADIANT ENERGY DRYING
NALCO DRITHERM
(INFRA-RED RAY)
CARBON LAMPS
Cut drying costs . . . Save time . . . Use minimum space . . . Get uniform results.
Write for information and prices today.
North American Elec. Lamp Co.
1030 Tyler Street St. Louis, Mo.

way related to the trees that produce mahogany.

In Modern, there were no startling developments. "Swedish Modern" lingers as one of the names for our contemporary furniture of simple form. A new name, however, is needed for our American Modern that is curvilinear in form and, in fact, often very hard to distinguish from the sophisticated Colonial or the simplified 18th Century forms. Speaking generally, Modern did not hold its own in amount shown, but it did improve in quality. It dominated furniture design in the low-price classes and over half of the modern furniture was in walnut. Mahogany in the modern styles was shown largely in the medium and upper price classes.

Fluorescent Lighting Bulletins

A number of bulletins that describe, illustrate, and quote prices on fluorescent lamps for office and factory use have been prepared for free distribution by Van Dyke Industries (designers and manufacturers of scientific lighting units), 2857 S. Halsted St., Chicago, Ill.

Classified Advertising

Rate: 45 cents per line per insertion—minimum $1.35

FOREMAN WANTED

Experienced foreman or supervisor for paint shop or factory. Must be experienced in lacquers, synthetic or baking enamels, wood particularly, and capable of handling men. Address IF-789, care Industrial Finishing.

POSITION WANTED

As FOREMAN FINISHER in large radio cabinet or furniture factory. 20 years' experience. Can handle any number of men. Furnish good references and will go anywhere. Address IF-786, care Industrial Finishing.

POSITION WANTED

By varnish, enamel and lacquer salesman now covering New York and Pennsylvania. Address IF-787, care Industrial Finishing.

YOUNG MAN WITH TECHNICAL TRAINING

And 12 years' experience in precision instrument finishing, including lacquering, enameling, plating, etc., desires position with firm where high-grade finishing is essential. Age 34. Address IF-788, care Industrial Finishing.

PROFITABLE SIDE LINE AVAILABLE

To salesmen calling on Industrial Finishing trade. We make a complete line of alkali cleaning materials for cleaning metals before galvanizing, plating or painting. Also paint strippers. Wide territory open. Address—The D. C. Cooper Co., 20 E. 18th St., Chicago, Ill.

FOR SALE

One 500-gallon Pfaudler glass lined, steam jacketed, closed kettle. All welded with motor drive, vertical enameled propellor type agitator. Enameled thermometer weld, 3-in. bottom outlet with stoneware valve. Leg supports cross braced. Miscellaneous enameled pipe fittings. Highly acid resistant. Has never been used. COOK PAINT & VARNISH COMPANY, Detroit, Mich.

INDUSTRIAL FINISHING MATERIAL SALESMAN WANTED

For Philadelphia, metropolitan New York and New England. Being one of the largest and oldest manufacturers of industrial finishing materials, we feel these openings exceptional for quality salesmen. Write previous experiences and qualifications, but only top-notch men need apply. JONES-DABNEY CO., Malden, Mass.

FOREMAN AVAILABLE

20 years' experience in enameling and plating. Prefer Chicago district. Capable handling men. Thorough knowledge of lacquers, synthetics and japans. Can furnish good references. Address IF-785, care Industrial Finishing.

SALES ENGINEER WANTED

Young man with basic college education in chemistry plus successful selling experience and practical knowledge of production problems. To uncover new industrial finishing uses of well-known product, show user how to fit it into his scheme of operation—and make the sale. Exceptional opportunity, with highest standing firm, in practically unworked field, for man with combination of qualities needed. Reply in detail giving experience. Confidential. Address IF-790, care Industrial Finishing.

SPECTRUM, CHEMICAL, MICRO-CHEMICAL,

Paint, Resin Analyses. "One Thousand Laws and Rules in Chemistry and Engineering"—(book) representative page sent on request. Industrial Training Courses by mail; class in Phila. INDUSTRIAL CONSULTANTS, P. O. Box 7515, Philadelphia.

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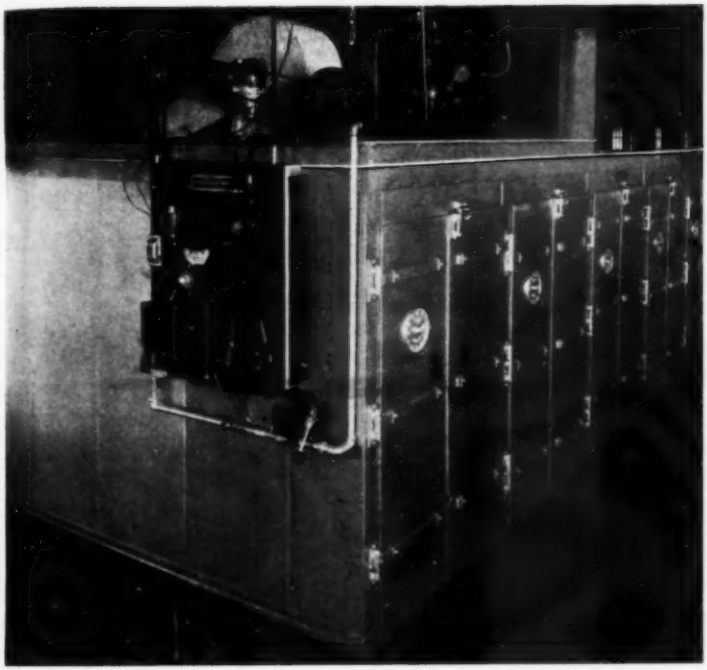
Zapon-Brevolite Lacquer Co.....2

I have been reading very attentively your January issue of Industrial Finishing magazine, especially the Review of Improved and New Finishing Materials, and I must say that I will certainly save this number, as there is a lot of information that I am in need of every day. Your magazine is the best and the most valuable I have ever received.—G. C. (Secretary-Treasurer of Furniture Manufacturing Company.)



INDUSTRIAL OVENS BY GKS

GKS engineers will be glad to work with you on your industrial ovens and complete finishing systems. Whether you require a truck type oven like the one illustrated above, a continuous conveying oven, a cabinet oven, or a complete finishing system, GKS engineers will give you the benefit of their experience in preparing designs and layouts for your approval. The use of this engineering service does not place you under any obligations. Write today for information on the ovens or complete finishing systems which you may be considering for immediate or future needs.

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This spring, in thousands of hardware stores throughout the country, customers will eagerly admire the newly launched "Silver Six" line of padlocks made by Yale & Towne. And the remarkable finish that gives them their name is S-277 Duranite.

A thorough study was made by Yale & Towne of S-277 to make sure it would stand up against all the conditions to which such a utility item as a padlock is subjected. After extensive tests for resistance to salt spray, humidity and abrasion, and also careful consideration of the very important factor of costs, S-277 "got the job".

It will be worth while to stop at your hardware store and get one of these handsome locks, look it over carefully and then subject it to tests. You will then appreciate the qualities of durability and beauty that appealed to the padlock manufacturer.

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